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"Water Resource Management and Public Perception in Greece"

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II. Abstract

As global population and global warming are increasing, sources of fresh water start to deplete. Scope of this dissertation is to present some fundamental wastewater treatment processes with a real example of a project in Thessaloniki as well as to examine the level of awareness and attitudes of people towards the concept and intention to use of recycled water. A questionnaire was used and the analysis showed that the respondents were somewhere in the middle as concerns their knowledge about this type of water and they generally agreed about the benefits and concerns of treated wastewater. Regarding gender, age, personal income and education, the level of knowledge was increased as the education level was higher and females were found to have more concerns, compared to men, to use the recycled water. On the other hand, these demographic criteria had no association with the intention to use the latter in household activities. Generally authorities have to establish trust in consumers regarding the acceptance and use of recycled water and more emphasis should be placed on the promotion of it, mainly though the Internet.

"*If the wars of this century were fought over oil, the wars of the next century will be fought over water - unless we change our approach to managing this precious and vital resource*"

Ismail Serageldin*, August 1995

* Ismail Serageldin serves as Chair and Member of a number of advisory committees for academic, research, scientific and international institutions and civil society efforts and has published over sixty books and monographs and over two hundred papers on a variety of topics including biotechnology, rural development, sustainability and the value of science to society (source: http://www.serageldin.com/ShortBio.htm).

III. Acknowledgements

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IV. Table of contents

V. List of Tables

Page

V. List of Figures

Page

1. Introduction

As global population increases along with global warming, due to greenhouse phenomenon, water shortage and scarcity become the main reasons that drive many countries across the world to adopt and develop procedures of producing water from alternative sources such as seawater, groundwater or wastewater. Wastewater is the sewage effluents, either industrial or domestic, that undergo treatment in order to be reused in various activities depending on the level of treatment process. The specific category will be presented thoroughly in this thesis.

Basic aim of this thesis is to fill in the gap that exists in literature as regards to, on one hand, the knowledge about the existence of wastewater treatment plants in the greater area of Thessaloniki city in Greece and, on the other hand, the public perception and intention to use of recycled water from treated wastewater. Hundreds of articles have been written and focus on wastewater projects that have been developed or are under development and wastewater treatment facilities that operate in many countries. Other articles pay particular attention to the level of public knowledge and acceptance of reclaimed water. Articles have also been written about the wastewater treatment plants that operate in Greece, such as in Crete, and Kavala, and the way the farmers - since reclaimed water is used so far only for agricultural purposes - perceive it. Nevertheless, up until now no similar research has been presented for Thessaloniki city.

Objectives of this thesis are to present, within the limits of a dissertation, the technological and theoretical framework that is applied in Thessaloniki as well as the level of public knowledge, acceptance and intention to use of recycled water, if it was available. For that reason and as the title of the dissertation reveals, the thesis is comprised of two big sections. The first section, the technological one, is referred to “Water Resource Management in Greece” and provides some basic information about the levels of effluents’ treatment generally as well as wastewater projects that run internationally, in Greece and specifically a project that runs in Thessaloniki. The second section, the theoretical one, is referred to “Public Perception in Greece” and provides the relevant, about wastewater management, legal framework that there is as well as public attitudes about recycled water that other studies have found and a comparison with the findings of the present survey.

The dissertation consists of 8 chapters. In the first part of chapter 2, wastewater projects that operate in international and European level - including Greece - or projects that were

designed to be implemented in the future will be presented. In the second part, seven themes were developed - knowledge of wastewater reuse categories, benefits, concerns, source and way of information, motives and intention to use - in order to be examined what shapes public perception. In Chapter 3, the basic wastewater treatment levels, such as preliminary, secondary etc. are provided. In Chapter 4 the Thessaloniki Wastewater Treatment Plant (ThWWTP) is presented. A real case of a wastewater project that operates in the city, some historical and economic data about it, what are the challenges and how recycled water's recipients (farmers so far) perceive it are the issues that will be presented. In Chapter 5 the legal framework about management of city's sewage effluents is set out such as the obligations of the provider of recovered water.

In Chapter 6 the methodological framework is presented more specifically. In Chapter 7 an analysis of the questionnaire's data, on which regression analyses and descriptive statistics were run, is provided. Moreover, a hypothesis testing was conducted. It was found that consumers generally agree with the benefits regarding recycled water and this opinion is enhanced as the education level increases whereas women were found to be more concerned, compared to men, to use recycled water. Finally, demographic criteria were found insignificant in the intention to use the specific - non potable - type of water in household/domestic activities. In Chapter 8, a comparative analysis, between the findings of this survey and what other studies have found, is performed in order to be examined what of the survey's findings are consistent or not with findings of other studies. In Chapter 9 the limitations of this thesis are provided while in Chapter 10 some basic conclusions and recommendations are made about how public acceptance of recycled water can be increased with the proper proactive actions such as the promotion through the Internet. The following chapter provides a literature review of wastewater projects and public perception about it.

2. Literature Review

2.1 Introduction

In Chapter 2 of the dissertation they are going to be presented some of the projects, regarding the treatment processes and methods of wastewater and its reuse potentials, which have been developed and operate worldwide or they have been made on a theoretical basis and are under consideration and future development. These wastewater projects, which will be contained in the first section of this chapter, were split into two main categories: the international projects and the European ones. In the second section of this chapter, the focus will be on the public perception and participation regarding the recycled water. For this reason seven themes were developed: Reuse potentials, Benefits, Concerns, Source of Information, Control of Received Information, Motives and Intention to use. The literature review was based on scientific articles found in authoritative electronic databases such as *Sciencedirect* and *Elsevier*. The following subchapter discusses the projects that have been developed internationally and in Europe.

2.2 Wastewater projects

Regarding the wastewater projects in *international level*, in *China*, Yang & Abbaspour (2007) established, taking city of Beijing as a case study, a systematic framework for the potential of wastewater treatment and reuse not only in the specific city but also in other cities of China as well as developing countries with similar conditions. For this purpose they used a linear programming model based on the relationship between reuse demand and supply. The amount of water that can be reused is subject to technical, physical, socio-economic and institutional constraints. Despite the fact that many wastewater treatment plants (WWTPs) have been constructed in Beijing, in 2007 the treatment ratio was 50% and the target was to reach the level of 90%. The results of the model were that the potential for reuse of treated effluents depends, among all the aforementioned constraints, on the prices of both reclaimed and fresh water as well as the existence of economic gains from the reuse.

Figure 1: Beijing's Gaobeidian Wastewater Treatment Plant, China
Source: http://www.sherwoodinstitute.org

In *China*, Chu et al. (2004) also established a systematic framework for wastewater reuse potential. In addition to the linear programming model, they performed a sensitivity analysis and a Robust Counterpart (RC) optimization. They also found that the amount of water that can be reused is subject to specific constraints (environmental, legal, and political). The source of treated effluents can be from either a central wastewater treatment plant or a decentralized in-house (or on-site) grey-wastewater treatment facility. The result of this model was that water resource management in the country can be improved through in-depth examination of the relative costs and profits in different areas.

Figure 2: China's Bei Xiaohe Waste Water Treatment Plant
Source: http://china.gongkong.com

In the *United States of America*, there are many cities where wastewater reuse applications took place from 1912 to 1987 such as lawn watering, cooling water, landscape irrigation (i.e. cemetery), agricultural irrigation, domestic water (i.e. toilet flushing) and groundwater recharge. Some of these cities are: Golden Gate Park, Grand Canyon National Park, City of Pomona, City of Baltimore, City of Colorado Springs, City of St. Petersburg, City of El Paso etc. (Metcalf & Eddy, 2004, p. 1350).

Figure 3: Point Loma Wastewater Treatment Plant in California, USA
Source: http://www.oceanlight.com

Regarding the wastewater projects in *European level*, in the *Czech Republic*, more specifically in the southern Moravia, Janosova et al. (2006) identified two regions characterized as water stressed areas (water shortage). On this basis, it is examined how wastewater reclamation can be the solution to this problem taking into consideration water quality, climatic and environmental impact. The water shortage in the first region is attributed to abstraction of surface water whereas in the second one the shortage is attributed to reduced capacity for water storage in the forested lands. It was found that reclaimed wastewater is the best solution to be applied in the industrial sector in the first case but in the second case it would be better to be used in the agricultural sector.

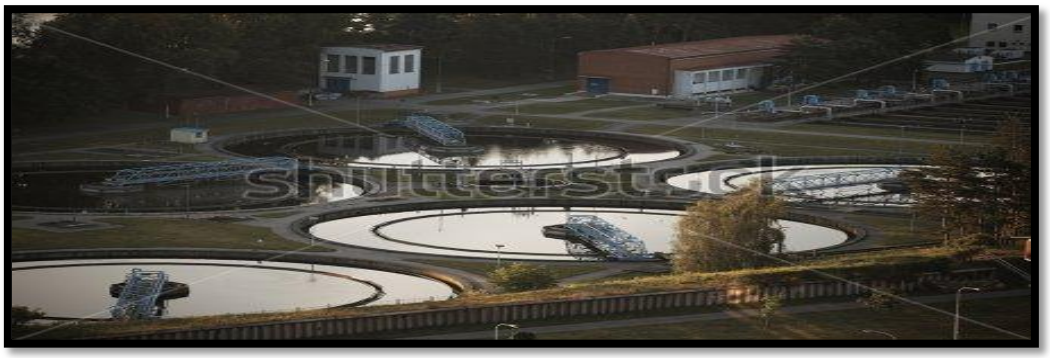

Figure 4: Czech Republic's waste water treatment plant
Source: http://www.shutterstock.com

In *Cyprus*, Fatta & Anayiotou (2007) developed, with the financial support of EU's Europe Aid program, the MEDAWARE project, a project which aims to change the unsustainable practices in the Mediterranean region as concerns to urban wastewater treatment and reuse in the agricultural sector as well as to enhance the respective professional capacity building. The project was comprised of four types of sub-strategies and the conclusions were

that, among many Mediterranean countries (i.e. Turkey, Lebanon, Greece etc.), mutual trust and co-operation have to be strengthen, information and technology have to be transferred and exchanged and recipients (i.e. farmers, general public) of the treated wastewater have to educated and become more aware.

Figure 5: Wastewater treatment plant in Nicosia of Cyprus
Source: http://www.water-technology.net

In *Italy*, Lopez et al. (2006) analyze the AQUATEC project which has been financed by the Italian government and the European Community. Purpose of the project was to examine the efficiency of four technological options as alternatives for production of recycled water from effluents in the agricultural sector. The first one was membrane filtration and the microbial quality of treated wastewater was proven higher than the respected one from the local well-water. Simplified treatments were the second option where the quality of the treated effluents caused a yield increase of 50% of irrigated olive trees. In the third option of wastewater storage reservoirs, nutrient concentrations were within the WW Italian limits and finally, in the constructed wetlands, the decrease of microorganisms was noteworthy.

Figure 6: Wastewater treatment plant in Italy
Source: http://www.engineerlive.com

In *Spain*, Deniz et al. (2010) present different options of tertiary wastewater treatments. The Royal Decree 1620/2007 is the legal framework in the country which establishes the

pollutant parameters and defines the maximum limits in water quality that have to be obtained in order effluents to be reused in agricultural purposes. Wastewater treatment plants in Gran Canaria Island of Spain are taken as a case study and particularly the treatment plant of Hoya del Pozo. Despite the fact that the particular plant uses all of its process units to render wastewater proper for reuse in agricultural sector, there are still some compounds that have to be removed in order the advanced treatment to be efficient.

Figure 7: Wastewater treatment plant in Spain
Source: http://www.eptisa.com

In *Greece*, Bakopoulou et al. (2011) refer to the water imbalance that the country experiences so often due to a number of reasons such as regional variations of rainfall and increased demand for water in the summer period. In Thessaly this imbalance is attributed to intensive agricultural activity. Samples were taken from the four wastewater treatment plants that operate in Tirnavos, Volos, Karditsa and Larissa in order the quality of the effluents to be examined based on physicochemical, microbiological and toxicity criteria. While the first category of criteria is fulfilled, the second ones indicate that treated effluents should be used carefully.

Figure 8: Wastewater treatment plant of Saint Lawrence of Pelion in Volos
Source: http://www.localit.gr

Furthermore, Agrafioti & Diamantopoulos (2012) also present a strategic plan about the potential of treated wastewater reuse for agricultural purpose in the island of Crete where sixteen treatment plants are operating. Three types of crops were examined: olive trees, vineyards and lettuce. The parameters set for this study were that the water storage tanks have to be in lower elevation than treatment facilities and as close as possible to the wastewater treatment plants and irrigation areas so pumping costs to be low. The results showed that, although effective precipitation can improve crop quality and productivity, further tertiary treatment of wastewater is required. The following subchapter discusses the seven themes that were developed in order to be demonstrated how public perception is shaped.

Figure 9: Wastewater treatment facility of Settlement of Thrapsanou in Crete
Source: http://www.mesogeos.gr

2.3 Wastewater public perception

As concerns to the *reuse potentials* of wastewater, there are many purposes that treated or reclaimed wastewater can be reused according to the level of treatment of the effluents. One category is *agricultural irrigation*. This category includes irrigation of crops, flowers (Janosova et al., 2006), cotton, fodder, orchard (Friedler et al., 2006), commercial nurseries (Lu et al., 2003). A second category is *landscape irrigation*. This category includes irrigation of parks, school yards (Friedler et al., 2006), freeway medians, golf courses, cemeteries, greenbelts, residential (Lu et al., 2003). A third category is *industrial reuse*. This category includes cooling water for thermal power plants (Yang & Abbaspour, 2007; Janosova et al., 2006), boiler feed, process water, heavy construction (Lu et al., 2003). A fourth category is *groundwater recharge*. This category includes groundwater replenishment, saltwater intrusion control, subsidence control (Chu et al., 2004).

A fifth category is *recreational and environmental uses*. This category includes creating artificial wetlands, sustaining in-stream flows, recreational water amenities, aquifer recharge (Yang & Abbaspour, 2007; Bixio et al., 2006), enhancing natural wetlands (Chu et al., 2004), recreational lakes – fishing and boating (Friedler et al., 2006). The last category is *non-potable urban uses*. This category includes urban lawn watering, road cleaning, car washing, toilet flushing (Yang & Abbaspour, 2007), garden watering (Chu et al., 2004). Bixio et al., (2006) also identified another category of wastewater reuse: a combination of the first, the third and the fifth category described above (mixed uses). It is noteworthy to mention that there is also another category: the potable use, which is comprised of pipe-to-pipe water supply and blending in water supply reservoirs (Lu et al., 2003; Huertas et al., 2008). This category was not included in the survey since the specific reuse category is not suggested by the Urban Waste Water Directive.

As concerns to the *benefits* of recycled water from treated wastewater, recycled water can be reused in many activities which can result in a wide range of benefits such as economic, environmental, social etc. Wastewater reuse can: facilitate water conservation; maintain downstream environmental quality; reduce the demand for fresh water - in that way it is an alternative, sustainable and viable source of water (Eden, 1996) - as well as maximize simultaneously the use of restricted water resources. Furthermore, it can contribute to the economic development of a country; decrease the pollution - and specifically coastal one - as less amount of effluents is discharge to water surfaces and shorten the hydrological cycle until the water is used again (Janosova et al., 2006; Deniz et al., 2010).

In addition to economic gains, wastewater reuse can control and reduce the exploitation of natural sources and aquifers, contributing in that way in the protection of the environment (Lopez et al., 2006; Deniz et al., 2010). Reclaimed water, especially when it is the result of sewage or industrial treated effluents, can be a constant and reliable supply. Reuse of these effluents can prevent and reduce, partially or completely, the negative effects which would be caused by their release to rivers and lakes. Another aspect is that recycled water, when it contains considerable amounts of nutrients (i.e. nitrogen and phosphate) depending on the level of treatment process, can be used as fertilizer by farmers. The presence of these nutrients increases the metabolic activity (Toze, 2006; Dolnicar & Saunders, 2006).

As regards to the *concerns* about recycled water, many studies have been conducted, with the use of surveys and questionnaires, to examine the reasons why the public has reservation about the use of reclaimed water. Some of these are: the level of treatment of the

recycled water (Al-Jayyousi, 2003), the health impact related to the inadvertent consumption of the treated water, the price of the recycled water (Urkiaga et al., 2006), the salinity and the existence of pathogenic microorganisms to effluents harmful not only for the public but also for the environment (Deniz et al., 2010), public health and the environmental effect of microbiological agents, quality and cost of treated wastewater (Dolnicar & Saunders, 2006).

There are also other compounds which could be present in wastewater and can have deleterious implications to human health and/or the environment, even after conventional treatment of the effluents. Examples of such compounds are: pathogens such as viruses, bacteria, protozoa and helminthes, trace organics and heavy metals, endocrine disrupting chemicals, pharmaceutically-active compounds, nutrients (organic or inorganic), salinity (Toze, 2006) inorganic compounds, heavy metals in soil, persistent organic pollutants (Fatta-Kassinos et al., 2011). Generally consumers are favorable towards the use of recycled water, especially when this involves irrigation of public open spaces such as crop irrigation. However, they are less favorable towards treated wastewater when this concerns household or when the chance of personal physical contact increases (Toze, 2006).

As concerns to the *source of information* that recipients of recycled water would use in order to learn about it, in an integrated water resource management plan the stakeholders that are involved include regulators, users, providers and neighbors (Urkiaga et al., 2006). These stakeholders may not be interested in this wastewater reuse system but, indirectly, they participate and are related to it. One category of stakeholder is the politicians whose priority is the implementation of reuse programs. The second category is the civil servants and this category includes health, water and waste authorities. Each one of these authorities authorizes the reuse program from a health, water resources and waste point of view respectively (Salgot, 2008).

Another category is the managers and the operators of a wastewater treatment and reclamation facility. Main obligations of them are to ensure clear procedures for reuse and to detect any kind of malfunctions. A fourth category is end users and this category includes municipalities, farmers, golf courses and other. Another category is consumers and these are public in general. The sixth category includes neighbors or, in other words, residents (temporal or permanent) and passers-by. The final category is the indirectly-related people and this category comprises of lawyers, facilitators, researchers, economists and other (Salgot, 2008).

As concerns to the *ways* the recycled water's recipients would use to *control* the *received information*, the latter was proven to affect positively the public attitude towards reclaimed water. The following activities can contribute to this purpose: free telephone information lines, web sites, community information sessions, stakeholder meetings (they have already been mentioned), fact sheets, newsletters, community focus group research, press advertisements, planning focus meetings and project summary documents (Urkiaga et al., 2006). Moreover, it has been proven that personal communication channels such as colleagues, family and friends can create positive messages as sources of information (Hartley, 2006).

As concerns to the *motives* that can encourage the use of reclaimed water not only strictly to agricultural sector, as it happens in many countries worldwide, but also in household/domestic activities information has been found the most powerful motive. Dissemination of clear, simple and reliable information is a motive for establishment of trust among stakeholders (Bixio et al., 2006). Information have to be accurate, detailed, timely and on-going (recipients have to kept updated). Providing extra information and information sessions about the different benefits and advantages of reclaimed water - for instance economic gains in tourism - were found to have a positive influence on social acceptance as well as to have a statistical significance on willingness of user (Urkiaga et al., 2006).

The quality and the adequacy of alternative sources is a considerable factor in consumer's attitude towards recycled water (Baumann, 1983). The influence of other people, religion, the perception and experience of water restrictions (water shortage), impact of environmental attitudes, watching State TV channels and possession of positive perceptions about recycled water were found, among nine factors examined, to increase the likelihood of using reclaimed water. Public campaigns can also increase acceptance and use by public (Dolnicar et al., 2011). Individuals who trust the Water Authority and its way of communication, accept quality differences between recycled and drinking water and recognize the financial value of recycled water and its association with low risk, are more favorable towards this type of water (Hurlimann et al., 2008). Conventional water prices' increase was found to have no impact on consumers' willingness to use reclaimed water (Dolnicar & Saunders, 2006).

User acceptance is increased if reclaimed water is from his/her wastewater than from a common public source. Acceptance is also amplified when: there is clear protection of public health; protection of the environment as well as promotion of water conservation are considered clear benefit of the reuse; the degree of physical contact is minimal; quality of recycled water is

considered high and wastewater, as the source of recycled water, is considered minimal; water supply problems are apparent and community is highly aware of them; the role of recycled water in water supply scheme is clear; there is, on behalf of users, great confidence in local management of public utilities and technologies and finally the cost of effluent treatment facilities and distribution systems/technologies is considered reasonable (Hartley, 2006).

As concerns to the *intention to use* recycled water, Dolnicar & Saunders (2006) cited the following particular uses in declining order of public opposition to them: food preparation in restaurants, drinking, preparation of canned vegetables, cooking, bathing, spreading on sandy area, swimming, home laundry, manufacture of facial tissue, commercial laundry, irrigation of dairy pastures, irrigation of processed food crops, irrigation of vineyards, fishing, irrigation of forests, commercial air conditioning, pleasure boating, electronic plant process water, toilet flushing, golf course hazard lakes, lawn / garden watering, water use (for public land, parks, cemeteries, verges), water use (for stables, sanctuaries), golf course irrigation, irrigation of freeway belts, industrial cooling, road construction, industrial air conditioning, fire fighting.

In a later study, Dolnicar & Schäfer (2009) added to the aforementioned particular uses the following ones: washing clothes, brushing teeth, bathing the baby, fish pond or aquarium, washing (the house, windows), religious/spiritual rituals, washing the car, swimming pool refilling, air conditioning, irrigation of sports fields. Friedler et al. (2006) conducted a survey of population attitudes towards particular reuses of wastewater assigning to them relative weights and average grades which represent the importance given to them by authors and correspondents respectively. As low contact reuses are considered: field crops irrigation, aquifer recharge for agricultural reuse, orchard irrigation. As medium contact reuses are considered: fire fighting, use in electronics industry, cotton processing industry, sidewalks landscape irrigation, air-conditioning water, public parks irrigation, commercial car-wash, private garden irrigation, domestic toilet flushing. As medium contact reuses are considered: domestic washing machine, recreational lake, vegetables (edible) irrigation, aquifer augmentation (drinking water) and use in preserved food industry. The following chapter discusses the basic levels of wastewater treatment that are followed generally.

3. Wastewater treatment methods

In Chapter 3 of the dissertation they are going to be presented some basic treatment methods of wastewater but not in a detailed way since this not the primary objective of this thesis. There are various methods of wastewater treatment according to the activity that recycled water will be used after the specific treatment method. The levels of treatment are the following ones: preliminary, primary, advanced primary, secondary with and without nutrient removal, tertiary, advanced and disinfection. These methods of treatment are called unit operations and the methods, in which chemical or biological reactions are required, are called unit processes (Metcalf & Eddy, 2004, p.11). In order a wastewater treatment plant to be cost-effective, it has to be ensured that there is storage within the treatment processes (Wang et al., 2008, p.197).

In *preliminary* treatment, wastewater compounds and gross solids (i.e. sticks, grease and rags) are removed since they can create problems, such as damage, in the maintenance or in the operation of the treatment processes and ancillary systems. In *primary* treatment, a physical operation is used in order suspended solids, organic matter and generally floating materials to be removed from wastewater. In *advanced primary* treatment, filtration and addition of chemicals is applied in order the suspended solids and organic matter to be removed in a more enhanced way (Metcalf & Eddy, 2004, p.11). In *secondary without nutrient removal* treatment, disinfection and removal of suspended solids and biodegradable organic solids takes place. In *secondary with nutrient removal* treatment, in addition to the aforementioned secondary treatment, removal of nutrients (phosphorus and/or nitrogen) takes place.

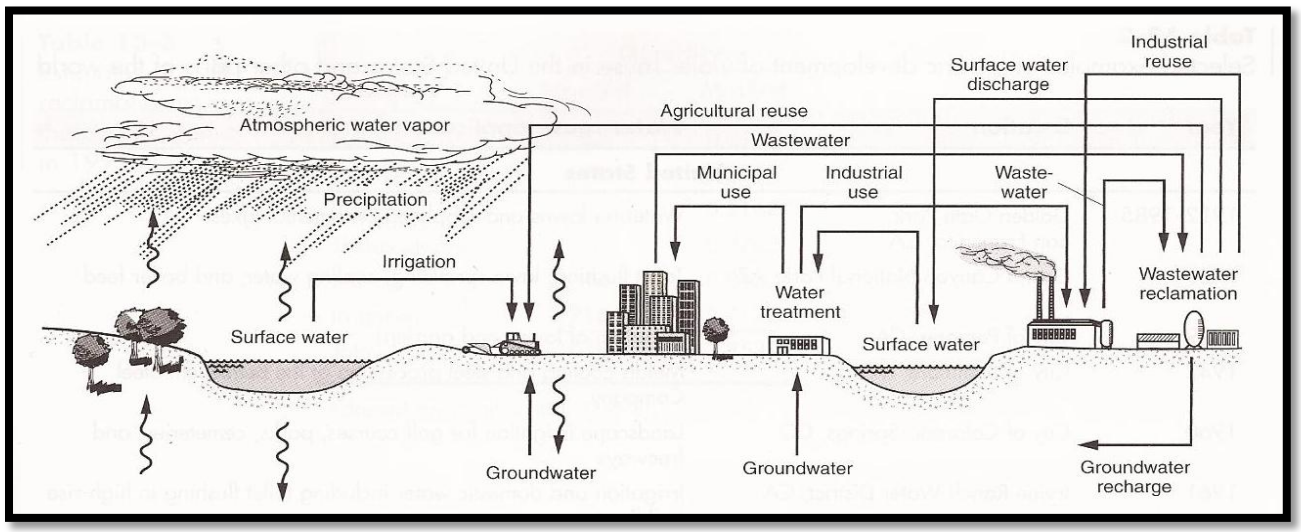

Figure 10: The role of engineered treatment, reclamation, and reuse facilities in the cycling of water through the hydrologic cycle
Source: Metcalf & Eddy, 2004, p.1349

In *tertiary* treatment, disinfection and removal of nutrients as well as of residual suspended solids (which have not been removed to a significant extent even after the secondary treatment) are included in this level. In *advanced* treatment, suspended and dissolved materials, which have been remained from the standard biological treatment, are removed (Metcalf & Eddy, 2004, p.11). Disinfection is the last stage of wastewater treatment process where chlorine gas is injected (Panoras and Ilias, 1999, p.18). In Figure 11 it is provided a typical wastewater treatment process:

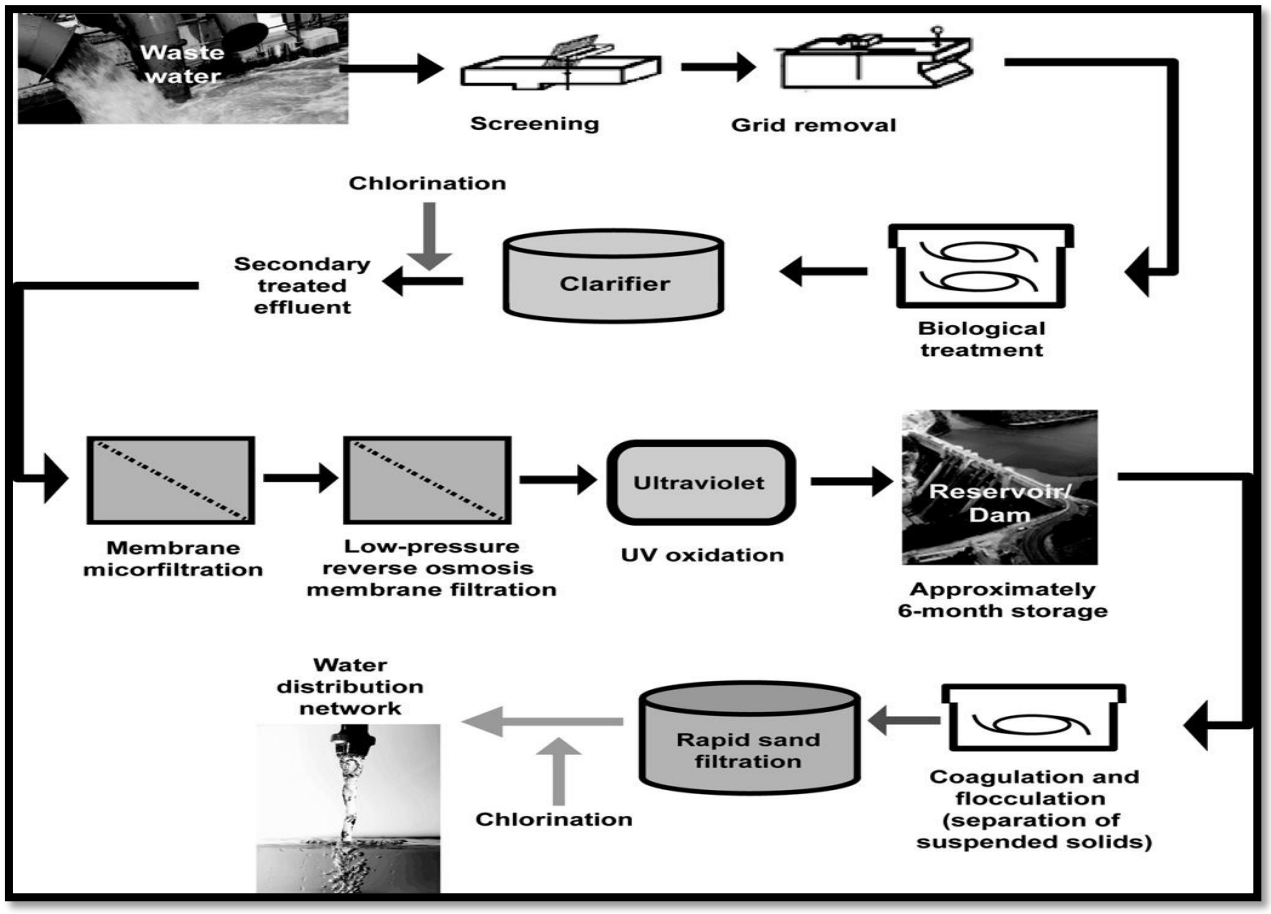

Figure 11: Schematic diagram illustrating treatment processes involved in a typical indirect potable water recycling scheme
Source: Dolnicar et al., 2010

Generally the minimum requirements in a wastewater treatment process should be: gross screening, aeration, sedimentation and disinfection (Neal, 1996), especially extended aeration can provide better quality of wastewater (Jamwal and Mittal, 2010). The following subchapter discusses a real wastewater treatment facility in Thessaloniki area.

4. Wastewater reuse in projects

In Chapter 4 of the dissertation it is going to be presented the Wastewater Treatment Plant which operates in Thessaloniki (ThWWTP), some historical data, the objectives of this project, how the water quality control is ensured, how end-users (specifically here the farmers) accept it and what are the benefits from water recycling. EYATH has the responsibility in the Greater Thessaloniki Area, an area of 20,000 hectares, for the management of sewage and storm water. Its treatment facility treats daily around 180,000 m^3 of domestic sewage which are disinfected before they would be discharged into the Thermaic Gulf through pipelines (Soupilas et al., 2012, p.2-3). The following subchapter discusses some historical information regarding the project.

Figure 12: Thessaloniki's wastewater treatment plant processing units' overview
Source: Soupilas et al., 2012, p. 2

4.1 History of the project

The Thessaloniki Water Supply & Sewerage Co. S.A. (EYATH) started its operation in 1992. Before this year and its merge with the Water Board, the Thessaloniki Sewerage Authority was responsible for the collection of wastewater not only in the city of Thessaloniki but also in the surrounding area. Since the wastewater collection systems were completed, the treatment and recycling of these effluents became the priority (Soupilas et al., 2012, p.4).

Abundant supply of low cost water, lack of knowledge and specialization on behalf of public sector personnel were the main reasons that explain the absence of interest for these projects. However, in the summer of 1995, the aforementioned wastewater reuse projects started to proceed when the drought of that period and the consequent need for irrigation purposes made obvious the necessity for the reuse of city's effluents. Efforts to inform the Ministry of

Agriculture were made but the conversations were led to dead end f particular reasons (Soupilas et al., 2012, p.4).

Nevertheless, the demand for water from treated wastewater came from people requesting recycled water for various purposes (i.e. lawn watering, creation of an ecological park etc.). At the same time the personnel of EYATH started to become more specialized and the establishment of a pilot research project, which was using treated wastewater, boosted the interest and efforts for expansion of the project, besides irrigation (Soupilas et al., 2012, p.4).

4.2 Water quality control and challenges

The Thessaloniki Wastewater Treatment Plant (ThWWTP) is responsible for the treatment processes. There is the preliminary treatment where grease, sand and floating materials are removed; there is the biological treatment and the advanced treatment where effluents' disinfection with chlorine and anaerobic treatment of the latter in anaerobic digesters take place. Further procedures involve thickening in belt filter presses, sludge stabilization with lime addition and thermal drying to ten percent solids. Particularly for irrigation purposes, sludge is disposed as soil fertilizer conditioner (Soupilas et al., 2012, p.5).

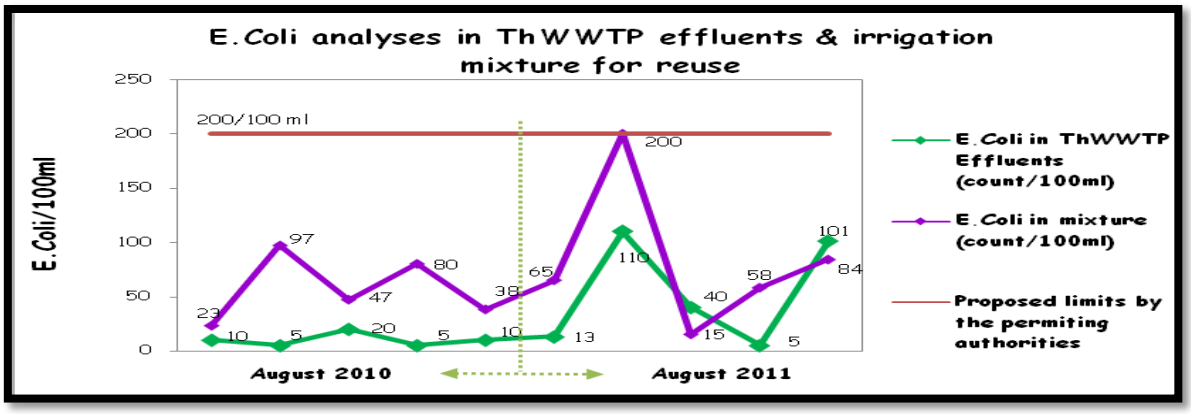

Figure 13: E. coli analyses in ThWWTP effluent & irrigation mixture area
Source: Soupilas et al., 2012, p. 7

According to Urban Waste Water Directive, the Thermaic Gulf is a sensitive area and the treated effluents are disposed there. In the ThWWTP the mixing process, that is followed, blends in the irrigation channels the irrigation water with the treated effluents which flow by gravity. Moreover there is constant control to avoid penetration of seawater to the treated effluents (Soupilas et al., 2012, p.5). After observation it was found that, although the

monitoring process of the project was very project was very austere comparing to other comparable projects in other countries, all the requirements were ensured and fulfilled so that flaws to be eliminated in future projects. As a result, the ThWWTP runs effectively the last five years and all the physicochemical, microbiological and heavy metals analyses confirm that the reuse of wastewater is not dangerous for irrigation purposes. Artificial Recharge (AR), a pilot program contributes to this target (Soupilas et al., 2012, p.7).

Figure 14: Performing laboratory analyses
Source: Soupilas et al., 2012, p. 6

However, two obstacles appeared during the project. The first one was the increased conductivity of the effluents whereas the second one had to do with the renewal of the Environmental Terms of the project. Nevertheless, the problems were overcome successfully: in the first case the monitoring process of the wastewater conductivity became more intense and uninterrupted and at the same time, as regards to the renewal, the project kept running while the managers of it were still waiting for the renewal (Soupilas et al., 2012, p.8).

4.3 Economic data of the project

The initial total cost for the construction of the ThWWTP in the 1990's was about one hundred forty million euro (€140 million). The Cohesion Fund of the European Union contributed financially to the project by 85% of the total costs. Although the Ministry of Agriculture had already constructed the initial irrigation distribution system, yet part of the project was the creation of a disposal pipeline through agricultural areas (Soupilas et al., 2012, p.11).

Regarding other costs, there were no capital costs generally. There were no extra expenses as regards to the maintenance of the irrigation channels since this was part of the initial budget. The gravity, with which effluents flow, requires no special energy, so there are no operational expenses. As concerns to operation costs, these have to do with monitoring and analyzing as technicians and chemists do the analyses. There are no extra treatment costs since the advanced treatment of the wastewater is constant. Future costs concerning maintenance and update of existing systems are also taken into account (Soupilas et al., 2012, p.11).

EYATH is very concerned about its pricing policy and try to keep water and wastewater tariffs low in an effort to promote and encourage the concept of water recycling not only for consumers but also for farmers since the company provide to the latter treated wastewater for free. There are many benefits as regards to water recycling. First of all, farmers have a direct economic benefit since they use this type of water for free and thus money saved due to the nutrients, included in treated wastewater, which can be used as fertilizers. Moreover, EYATH emerges as a credible company-provider of recycled water, more freshwater is available to the general public, whose awareness start to increase, and less nutrients are discharged into the sensitive area of Thermaic Gulf, EYATH's personnel gets more specialized in future environmental projects and finally the compliance with the Environmental terms and Directives encourages improvements in treated effluents quality (Soupilas et al., 2012, p.12).

4.4 Water reuse application

Chalastra – Kalochori is the area where the project has been applying for the last five years. Farmers' Union, TOEV Chalastras – Kalochoriou, gave the permission and contributed to the operation of the project. Until now the treated effluents are used for irrigation purposes only in the agriculture sector. In the specific area the major crops that are cultivated are rice (66%), corn (14%), cotton (8%) and others (2%). Although the monitoring and quality controls of the effluents are tight, some precautions are required such as protective clothes in order direct contact with recycled water that may contain pathogens to be avoided (Soupilas et al., 2012, p.9).

Figure 15: Microfiltration-reverse osmosis membrane pilot plant
Source: Soupilas et al., 2012, p. 9

EYATH also developed another project by introducing the Artificial Recharge (AR) for a sustainable future water supply. Aims of this project were the examination in the unsaturated zone of a possible plan for water storage and a buffer capacity for different pollutants. During the last five years, the total amount of treated wastewater that was used was between 1.6 to 5Mm^3 per year. This amount is not standard and varies each year for different reasons such as the quantity demanded by farmers and the amount of water that comes from rainfall (Soupilas et al., 2012, p.9-10).

Figure 16: Infiltration pond in artificial recharge test- site
Source: Soupilas et al., 2012, p. 9

4.5 Public awareness, acceptance and involvement

Incidents happened during the running of the project, especially during the summer or drought months, led more and more recipients and local authorities to trust the provided services of EYATH Company. An example was a high salinity incident. Another example was quality problems that occurred in the irrigation water in a region near to the ThWWTP. However, despite those incidents, the quick response, the willingness to discuss the actions which would

be taken, the already established high perception of the reclamation, implementation and monitoring processes and the gained publicity were the main reasons that increased the credibility of the Company and its project among farmers and local authorities (Soupilas et al., 2012, p.15).

Figure 17: Filming for the news media
Source: Soupilas et al., 2012, p. 13

Furthermore, the ThWWTP as a project encountered many difficulties even before its initial launch. Two were the main obstacles: the lack of national legislation or, in other words, a legal framework which could be used in the implementation of the project and the lack of technical experience on behalf of the company's personnel. Those reasons, in addition to the fact that there has not been a similar project in the past, make the relevant authorities to have doubts but, after a visit in the site, the required license was granted (Soupilas et al., 2012, p.10). In order to disseminate the necessary information to the end users, stakeholders and general public, the EYATH company organized educational activities at its premises and particularly the Water Museum and the ThWWTP. Leaflets , CD's and other educational material were distributed and interviews were given to the media (Soupilas et al., 2012, p.13).

Figure 18: Teaching water practicing
Source: Soupilas et al., 2012, p. 13

4.6 Future projects

The operation of EYATH's Wastewater Treatment Plant in Thessaloniki is planned to be expanded, apart from agricultural purposes, to other uses such as parks irrigation, fire fighting etc. with the establishment of small effluent treatment units with membranes. For this reason, Aquifer Recharge (AR) aims to provide information for company's plans about indirect potable reuse. The experience and the knowledge that EYATH has gathered all these years from the operation of the WWTP (advanced treatment) and its usefulness regarding the ecological benefits is the key for future projects (Soupilas et al., 2012, p.15). The following chapter discusses the latest legal framework for wastewater treatment and reuse in Greece.

Figure 19: Discussing future planning with local officials
Source: Soupilas et al., 2012, p. 15

5. Directive for wastewater

In Chapter 5 of the dissertation it is going to be presented the latest legal framework governing the treatment of industrial and domestic wastewater and their subsequent uses. In Greece the *Special Secretariat for Water* is responsible for the development and implementation of all programs associated with the management and protection of country's water resources. The Urban Wastewater Directive defines the maximum acceptable limits of the treated wastewater quality and the minimum necessary technical infrastructure and sewerage treatment plants that the towns and settlements of the European Union must have (ypeka, 2009).

In March 8th of 2011, in the Government Gazette, legislation or, in other words, a joint ministerial decision was published. It consists of sixteen Articles and represents a harmonization with the aforementioned Directive. The topic of this decision is "Defining measures, procedures and processes for reuse wastewater and other provisions". Regarding the *scope* of the Decision, it is applied in the planned reuse of treated wastewater which includes the agricultural use, the aquifers for industrial, urban and suburban use as well as the water systems. The reuse is authorized only for industrial use, limited irrigation and replenishment of underground aquifers. The disposal in water bodies, the recycling of industrial waste, the direct or indirect reuse for drinking purposes, the reuse for swimming (i.e. pool) and other household uses are not part of the Decision's scope (Government Gazette, 2012).

The *Decision*, in order to be implemented, provides all the necessary definitions and clarifies all the required terms that are associated with the wastewater such as "wastewater", "wastewater reuse", "direct reuse", "indirect reuse", "direct reuse of wastewater for drinking", "indirect wastewater reuse for drinking", "reuse for purposes other than drinking", "unplanned reuse", "scheduled reuse", "reuse without restrictions (unlimited)", "reuse with restrictions (limited)", "provisioning or recharge of underground aquifer", "reclaimed water provider", "user of reclaimed water", "management agency of recovered water", "recycling of industrial waste water", "urban waste water", "domestic waste water", "industrial fluids waste", "settlements", "population equivalent" and "sewage disposal" (Government Gazette, 2012).

Permission is required for the aforementioned reuse applications of treated wastewater and it is issued by the General Secretary of the Decentralized Administration with the approval of the Water Directorate of the Region. Moreover the provider of recovered water must be provided with the approval of environmental conditions so that the operation of the treatment plant effluent to be lawful and to comply with the requirements of wastewater treatment

(Government Gazette, 2012). As concerns to the *procedures* for issuing these licenses, the user or the management agency of the recovered water has to submit an application, accompanied with the environmental conditions, to the competent Water Directorate of Decentralized Management in order the license for the relevant wastewater reuse to be issued. The Water Directorate can request additional information from the concerned user. If environmental permitting is not required, then the license can be issued within twenty days; otherwise a period of forty five days is required from the full submission of the application (Government Gazette, 2012).

Regarding the *content* of the license, a permit includes the conditions of treated liquid waste reuse according to the specific use, the maximum allocated amount of treated wastewater depending on the specific use, the provider of recovered water, the period of the reuse of treated wastewater, the obligations of the user, the duration of the license as well as the conditions of recall, modification, cancellation or renewal of this license. The validity period of the permit cannot exceed the eight years from the date of issue. The same applies for the validity period of the environmental terms, if the relevant permit is required. Regarding the *obligations*, the provider of recovered water is obliged to make the minimum frequency of sampling and analysis for reuse of treated wastewater in accordance with the relevant provisions, record the results of the analyzes of the samples in a certified book as well as mention in it any incidents. The management agency or user the recovered water is obliged to display, in those areas where use of recovered water is made, proper labeling which will depict a spout of a facet labeled with the symbol "X" and the legible words "Recycled Water-Non Drinkable" in both Greek and English and ensure that the pipes of recovered water colored purple (Government Gazette, 2012). The following chapter discusses the methodology that was used in order the questionnaire to be structured.

6. Methodology

In Chapter 6 of the dissertation they are going to be presented the *quantitative research methods* that were used in order to learn and examine Greek consumers' attitudes about the recycled water from treated effluents, their knowledge and concerns about it, the means of communication that they would choose to learn more about it as well as how much willing they would be to accept it and use it in specific domestic/household activities. Moreover some hypotheses are going to be formulated based on the findings in the literature review. The following subchapter discusses the construction and distribution of the questionnaire.

6.1 Survey Design

The survey, in order to be conducted, was based on the design and construction of a questionnaire. The questionnaire was initially formulated in the English language but, in the course, it was made apparent that the additional formulation of a Greek version would be more understood and convenient to the respondents since some of the terms, included in the questions, were scientific and unfamiliar. The next step was the distribution of the questionnaire in two versions, the English and the Greek one. The questionnaire was distributed electronically through email accounts and accounts of social media such as Facebook. As regards to the procedure, Google Docs, a free online service of Google Company, was used in order to be ensured that the questionnaires' answers will be collected in a quick and trustworthy way.

The questionnaire was uploaded to this online service and the link was attached to the email message/request accompanied by an introductory text. In this text it was stated and explained to the respondents the topic of the dissertation which was conducted for the International Hellenic University, the reasons why their contribution to the completion of the questionnaire would be necessary and vital for the survey as well as the fact that their answers would be kept confidential and their anonymity was ensured. It was also clarified that the recycled water cannot be used for drinkable purposes. The questionnaire was distributed to approximately 2.000 people and those who eventually answered it were exactly 355, therefore the response rate was about 17%. The following subchapter discusses the measures that were used in the construction of the questionnaire.

6.2 Measures

Regarding the *measures* used in the survey, the questionnaire was structured in two sections. In the *first section* there were seven questions out of which five - particularly the first, second, third, sixth and seventh - were structured based on the Likert scale and the remaining two - that is the fourth and the fifth - were structured based on a ranking scale. In the Likert scale type questions the respondents were asked to rank the statements of each question - the second, the third, the sixth and the seventh - on a scale of 5 to 1 with 5 representing "I totally agree", 4 representing "Agree", 3 representing "Neither agree nor disagree", 2 representing "Disagree" and 1 representing "Strongly Disagree". The only exception was the first question where the scale was also form 5 to 1 with 5 representing "Very aware", 4 representing "Aware", 3 representing "Neither aware nor unaware", 2 representing "Unaware" and 1 representing "Completely unaware". In the ranking scale type questions the respondents were asked to classify the statements of each question - the fourth and the fifth - on a scale of 1 to 5 with 1 representing their "1st choice" (most preferable and convenient respectively) and 5 representing their "5th choice" (least preferable and convenient respectively).

Each question of Likert scale type represented a variable and was comprised of a number of statements. The first question represented the variable "Reuse Potentials" and included six statements. The second question represented the variable "Benefits" and included eight statements. The third question represented the variable "Concerns" and included seven statements. The sixth question represented the variable "Motives" and included eight statements. The seventh question represented the variable "Intention to use" and included seven statements. The fourth and fifth questions were comprised of five statements and represented the variables "Source of information" and "Control of received information" respectively. In the *second section* there were four questions which represented demographic information such as gender, age, personal annual income and level of education. Variable "Gender" was comprised of two categories, variable "Age" of five categories, variable "Income" of ten categories and variable "Education" of four categories.

As concerns to the fourth and fifth question, their results will be explained in the next chapter since they are going to be analyzed through descriptive statistics. Regression analysis will be conducted for the first, second third, sixth and seventh question. The average of each statement for each answer of a respondent - for instance the average of the six statements of the first question a respondent answered - was used as the dependent variable. The same procedure was followed for the other four questions. As independent variables, in the regression analysis,

were taken the four questions of the demographic data, namely gender, age, income and education. The questionnaire was structured in that way so each one of the Likert scale type questions to test the equivalent hypothesis presented in subchapter 6.3. The constructs that make up the questionnaire were taken from reliable scientific articles and were grouped in the categories-variables that have already been mentioned.

More specifically, the constructs for "Reuse Potentials" were taken from Janosova et al., 2006; Friedler et al., 2006; Yang & Abbaspour, 2007; Chu et al., 2004; Bixio et al., 2006. The constructs for "Benefits" were taken from Janosova et al., 2006; Deniz et al., 2010; Lopez et al., 2006; Toze, 2006; Dolnicar & Saunders, 2006. The constructs for "Concerns" were taken from Urkiaga et al., 2006; Deniz et al., 2010; Dolnicar & Saunders, 2006; Toze, 2006; Fatta-Kassinos et al., 2011. The constructs for "Source of information" were taken from Urkiaga et al., 2006; Salgot, 2008. The constructs for "Control of received information" were taken from Urkiaga et al., 2006; Hartley, 2006. The constructs for "Motives" were taken from Bixio et al., 2006; Urkiaga et al., 2006; Baumann, 1983; Dolnicar et al., 2011; Hurlimann et al., 2008; Dolnicar & Saunders, 2006; Hartley, 2006. Finally the constructs for "Intention to use" were taken from Dolnicar & Saunders, 2006; Dolnicar & Schäfer, 2009; Friedler et al., 2006. The following subchapter discusses the formulation of the hypotheses.

6.3 Hypotheses formulation

In subchapter 6.3 the formulated hypotheses about the knowledge and attitudes of Greek consumers regarding the recycled water are going to be provided. In order to be examined which of these hypotheses will be accepted or rejected, a regression analysis will be performed. The indicator $_0$ in the H_0 of any question represents the null hypothesis which is accepted when the p-value of the variable is larger than 0.05. Likewise the indicator $_1$ in the H_1 of any question represents the alternative hypothesis which is accepted when the p-value of the variable is smaller than 0.05. The analysis of these hypotheses is going to be presented in subchapter 7.3. In Table 1 there are totally five null hypotheses and five alternative ones and each one corresponds to the relevant construct/question of the questionnaire:

Table 1: Hypotheses formulation

Variables	**Hypothesis**	**Statements per question**
Reuse Potentials	$H_0$1: Consumers are not aware of wastewater reuse potentials $H_1$1: Consumers are aware of wastewater reuse potentials	6
Benefits	$H_0$2: Consumers do not agree with the benefits of using recycled water $H_1$2: Consumers agree with the benefits of using recycled water	8
Concerns	$H_0$3: Consumers do not agree with the concerns regarding recycled water $H_1$3: Consumers agree with the concerns regarding recycled water	7
Motives	$H_0$4: Consumers do not agree with the motives to accept the use of recycled water $H_1$4: Consumers agree with the motives to accept the use of recycled water	8
Intention to use	$H_0$5: Consumers do not agree with the potential household uses of recycled water $H_1$5: Consumers agree with the potential household uses of recycled water	7

The sum of the statements of each question represents a hypothesis. Depending on the level of significance (p-value) of the independent variables, the equivalent hypothesis will be accepted or rejected. The following chapter analyses the data of the questionnaire.

7. Findings/Data Analysis

In Chapter 7 of the dissertation it is going to be analyzed the demographic profile of the 355 Greek consumers who were the sample and participated in the survey by answering the questionnaire. It has to be mentioned that, although statistically it is not significant, out of the 355 respondents, 90 preferred to answer the English version of the questionnaire whereas 265 preferred to answer the Greek version of it. The following subchapter analyzes the demographic variables.

7.1 General profile of consumers

Regarding the variable "Gender", out of the 355 respondents, the 45% were male (n=160) whereas the 55% approximately were female (n=195). Schematically the distribution of results is provided in Figure 20:

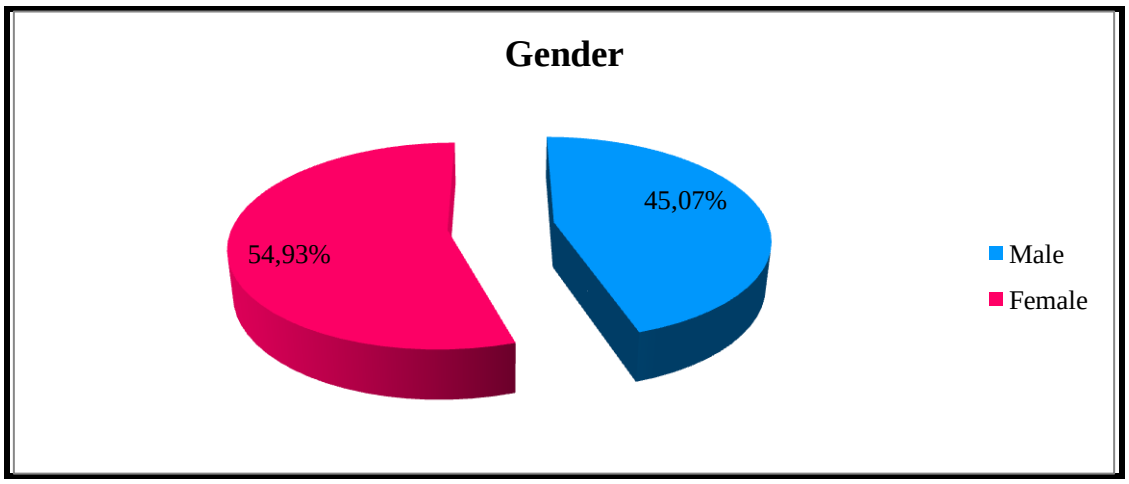

Figure 20: Gender:
Distribution of results

Regarding the variable "Age", out of the 355 respondents, the 41% belonged to the category of 18-29 years old (n=146), the 22% belonged to the category of 30-39 years old (n=79), the 11% belonged to the category of 40-49 years old (n=41), the 17% approximately belonged to the category of 50-59 years old (n=60) and finally the remaining 8% belonged to the category of 60 and above years old (n=29). Schematically the distribution of results is provided in Figure 21:

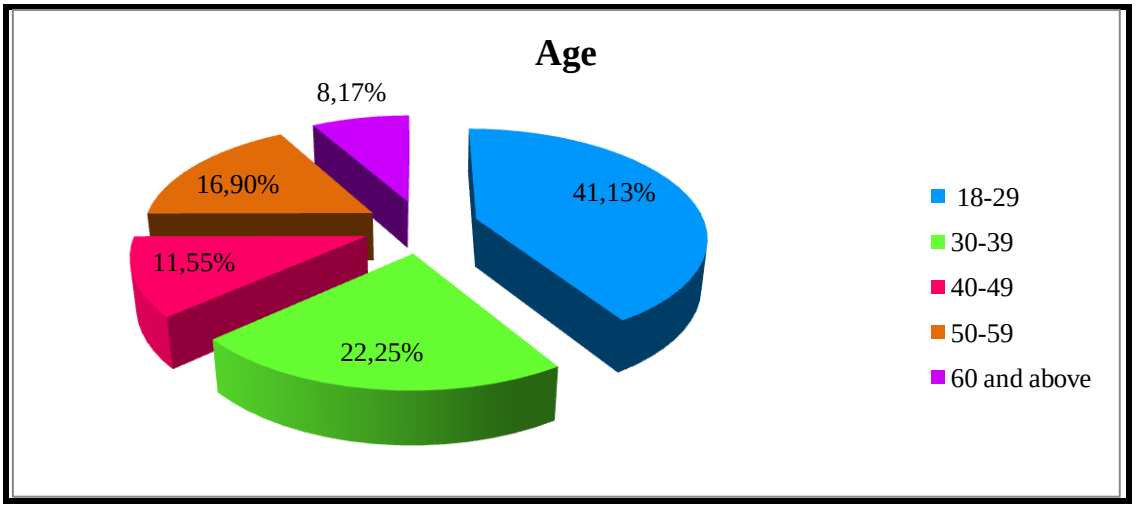

Figure 21: Age:
Distribution of results

Regarding the variable "Income", out of the 355 respondents, the 26% had a personal annual income less than €5.000 (n=94), the 18% had an income between €5.001 to €12.000 (n=64), the 24% had an income between €12.001 to €19.000 (n=86), the 15% had an income between €19.001 to €26.000 (n=53), the 7% approximately had an income between €26.001 to €33.000 (n=24), the 4% had an income between €33.001 to €40.000 (n=14), the 1.5% had an income between €40.001 to €47.000 (n=5) whereas another 1.5% had an income between €47.001 to €54.000 (n=5), the 0.5% had an income between €54.001 to €61.000 (n=2) and finally the remaining 2% had an income equal or above €61.001 (n=8). Schematically the distribution of results is provided in Figure 22:

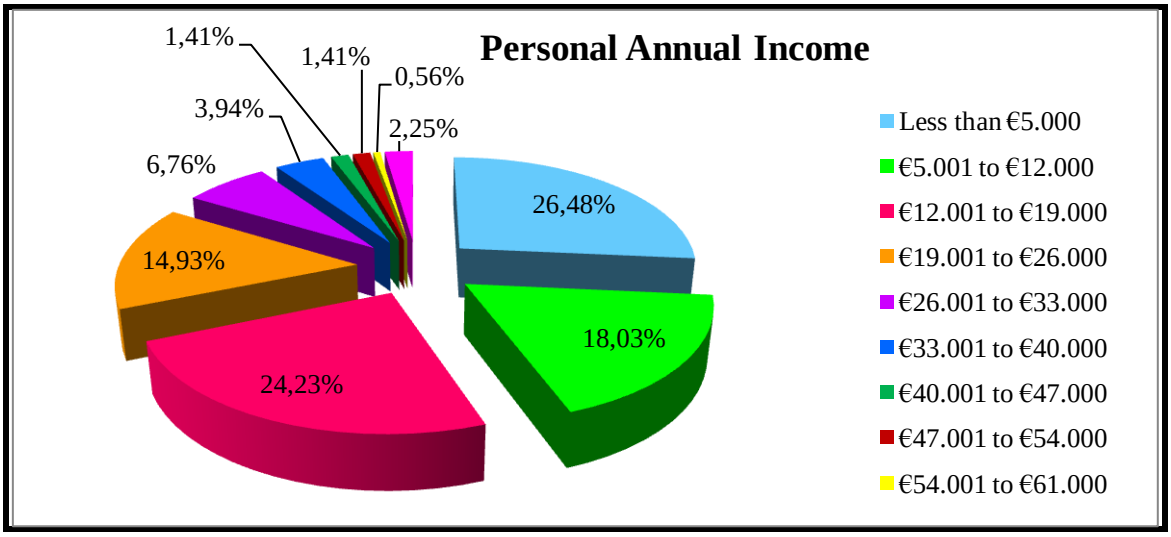

Figure 22: Personal Annual Income:
Distribution of results

Regarding the variable “Education”, out of the 355 respondents, the 16% had completed secondary education (i.e. high school) (n=58), the 10% had completed technological education (i.e. technological institution) (n=37), the 40% were holders of a bachelor degree (n=143) and the remaining 33% approximately were holders of a postgraduate diploma and/or a Ph.D. title (n=117). Schematically the distribution of results is provided in Figure 23:

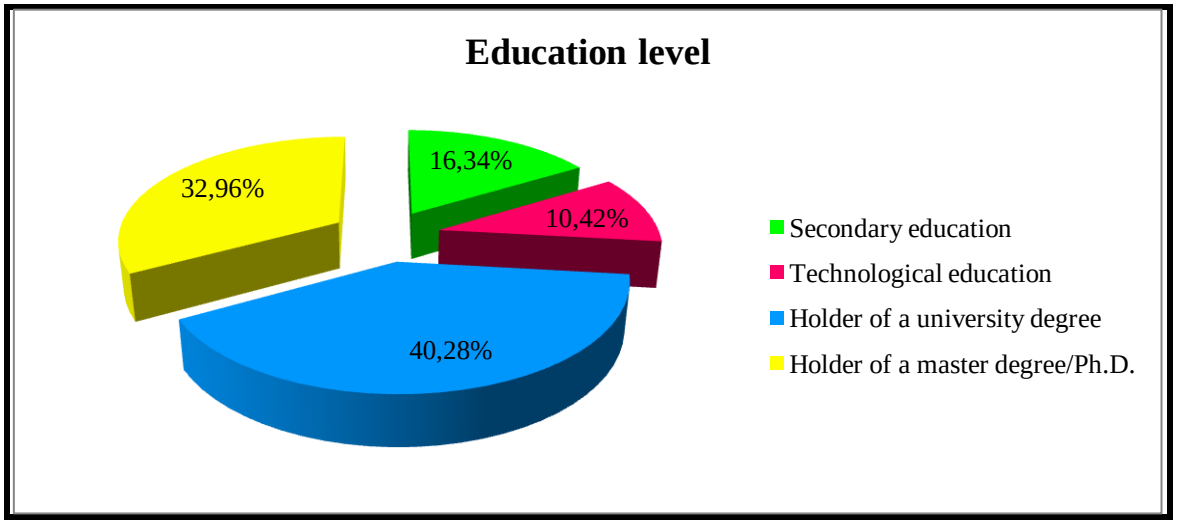

Figure 23: Education level:
Distribution of results

7.2 Descriptive Statistics Analysis

In subchapter 7.2 they are going to be analyzed the five variables (Likert scale type questions), in which a regression analysis and descriptive statistics were run, and the other two variables (Ranking scale type questions), in which descriptive statistics were run. In order the internal consistency/validity of the data to be tested, a reliability test was performed through the calculation of Cronbach Alpha. When this Alpha is between 0.6 and 0.7 or between 0.6 and 0.5 or below 0.5, then it is considered questionable, poor or unacceptable respectively. When it is above 0.9 or between 0.9 and 0.8 or between 0.8 and 0.7, then it is considered excellent, good or acceptable respectively. Therefore, Alpha at 0.7 was set as acceptable level and 0.5 as the minimum level in order constructs and statements that are below the latter level to be removed. In Table 2 there are the Alpha indicators of the five variables:

Table 2: Reliability test of variables

Reliability Statistics	
Variable	**Cronbach Alpha**
Reuse Potentials	0.873
Benefits	0.731
Concerns	0.801
Motives	0.660
Intention to use	0.779

More detailed tables, with the Cronbach Alpha of each statement of the five questions, are included in the Appendix 12.3. As it is apparent from the table, all the variables not only fulfill the basic requirement of the minimum level of 0.5 but also have good and acceptable levels of Alpha with the only exception of variable "Motives". Furthermore, a more detailed examination of the tables' column 'Cronbach's Alpha if Item Deleted' (Table 23) reveals that the 3rd statement of sixth question, even with the lowest Alpha of 0.585, is still above the minimum level.

Regarding the variables of the Likert scale questions, a descriptive statistics analysis was run in order the mean, the standard deviation and the mode to be found. The mean of each variable, was found by the calculation of the average all the statements of each question so that, for instance, the variable "Motives" represents the average answers to the sum of the eight statements of the sixth question. As concerns to the standard deviation and the mode, the relevant procedures were followed. In Table 3 there are the descriptive statistics of the five variables:

Table 3: Descriptive Statistics of variables

Variables	**N**	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**Mode**
Reuse Potentials	355	1.00	5.00	2.8859	1.13431	2
Benefits	355	1.00	5.00	3.7415	0.90677	4
Concerns	355	1.00	5.00	3.9871	0.83781	4
Motives	355	1.00	5.00	3.8377	1.04262	4
Intention to use	355	1.00	5.00	3.6616	1.30408	5

Mean is the sum of the observations divided by the number of them while the standard deviation is the difference between each observation and the mean. Mode is the observation with

the highest frequency. It was explained in subchapter 7.2 what each number represents and thus the extraction of some conclusions follows.

Consumers are neither aware nor unaware of the categories where wastewater can be reused. This conclusion is drawn by the fact that variable "Reuse potentials" has the lowest mean score out of all the variables, that is 2.8859, as well as it has a mode with the value of 2. Respondents were asked about their level of awareness or unawareness regarding the wastewater reuse categories such as agricultural irrigation and recreational uses.

Consumers generally agree with the benefits of using recycled water. Respondents were asked about their level of agreement or disagreement regarding the proven benefits from the use of recycled water such as the contribution to economic development and tourism. With a mean score of 3.7415 and a mode of 4, consumers tend to agree that the treatment of effluents can have a series of benefits.

Consumers generally agree with the concerns regarding recycled water. Respondents were asked about their level of agreement or disagreement regarding the proven concerns from the use of recycled water such as the level of treatment of the recycled water. With a mean score of 3.9871 and a mode of 4, consumers tend to agree that they preserve some serious reservations regarding the use of recycled water. The variable "Concerns" presents the highest mean score and the lowest standard deviation, namely 0.83781. The latter reveals that the respondents' opinions are, to a large extent, convergent.

Consumers generally agree with the motives to accept the use of recycled water. Respondents were asked about their level of agreement or disagreement regarding the motives to accept and use recycled water such as if there would be an increase in price of conventional water sources. With a mean score of 3.8377 and a mode of 4, consumers tend to agree that they agree with the given motives to accept this type of water.

Consumers generally agree with the potential household uses of recycled-non potable-water. Respondents were asked about their level of agreement or disagreement regarding the uses of recycled water for household activities such as car/vehicle washing. With a mean score of 3.6616 and a mode of 5, consumers have the intention to use recycled water to a greater extent in specific domestic activities compared to other domestic ones. This is the reason why the variable "Concerns" presents the highest standard deviation, namely 1.30408, which reveals that the respondents' opinions are divergent.

Regarding the variable "Source of Information", schematically the distribution of results is provided in Figure 24:

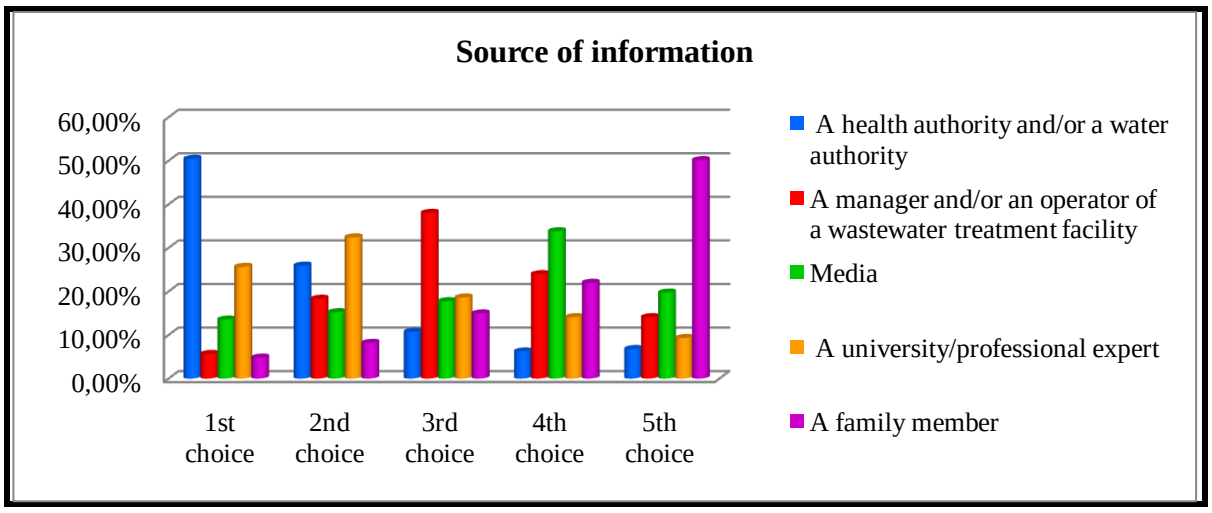

Figure 24: Source of information:
Distribution of results

Out of the 355 respondents, as their first choice of source of information regarding recycled water, the 50.42% chose "A health authority and/or a water authority" (n=179), the 5.63% chose "A manager and/or an operator of a wastewater treatment facility" (n=20), the 13.52% chose "Media" (n=48), the 25.63% chose "A university/professional expert" (n=91) and the remaining 4.79% chose "A family member" (n=17). Schematically a summarized distribution of results is provided in Figure 25:

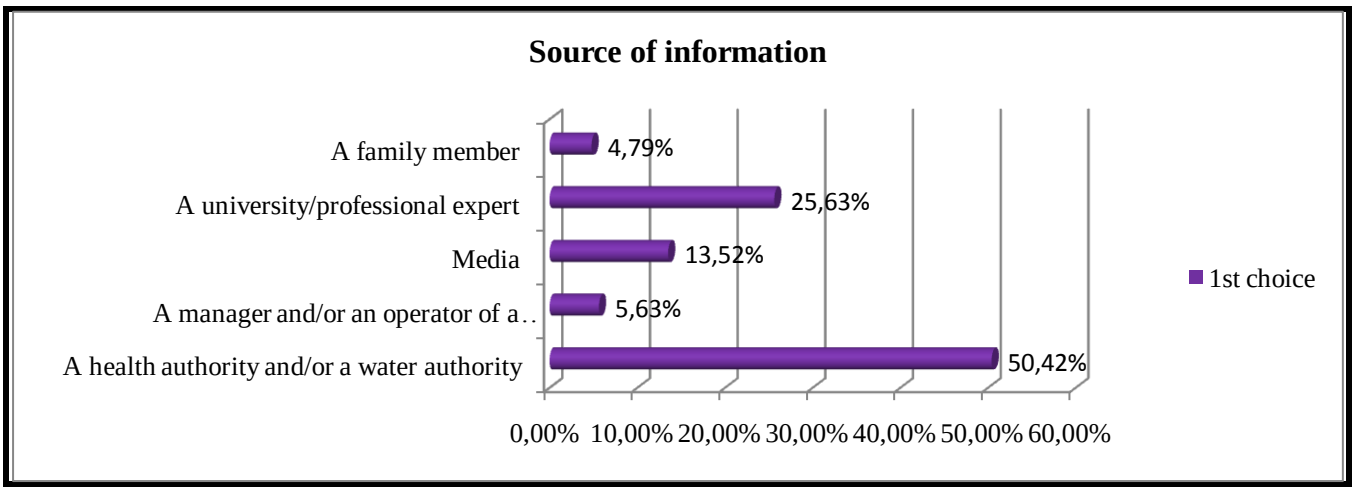

Figure 25: Source of information:
Summarized distribution of results

Regarding the variable "Way of Information", schematically the distribution of results is provided in Figure 26:

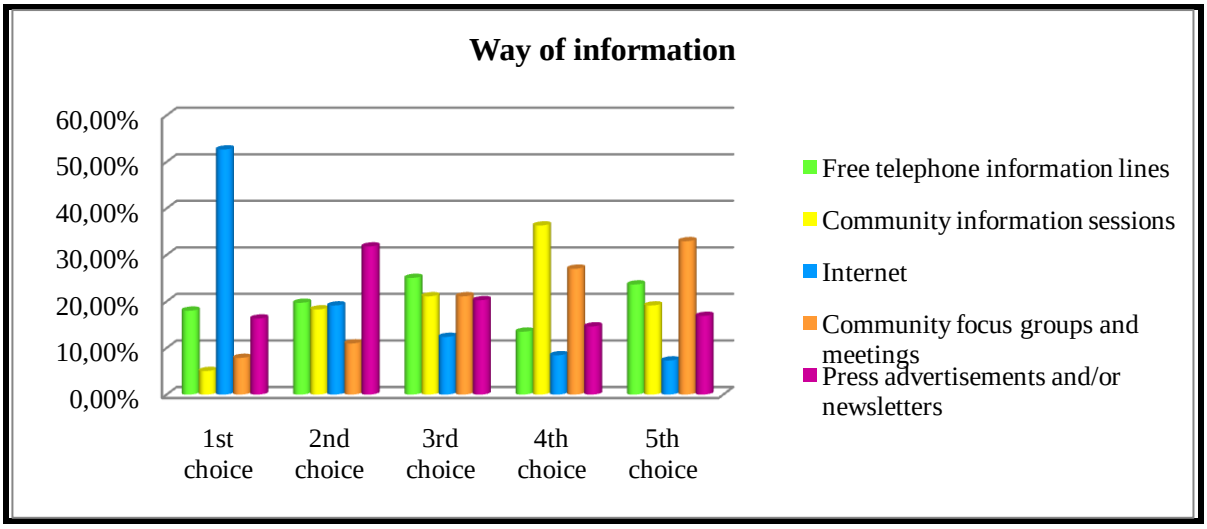

Figure 26: Way of information:
Distribution of results

Out of the 355 respondents, as their first choice of way of information regarding recycled water, the 18.03% chose "Free telephone information lines" (n=64), the 5.07% chose "Community information sessions" (n=18), the 52.68% chose "Internet" (n=187), the 7.89% chose "Community focus groups and meetings" (n=28) and the remaining 16.34% chose "Press advertisements and/or newsletters" (n=58). Schematically a summarized distribution of results is provided in Figure 27:

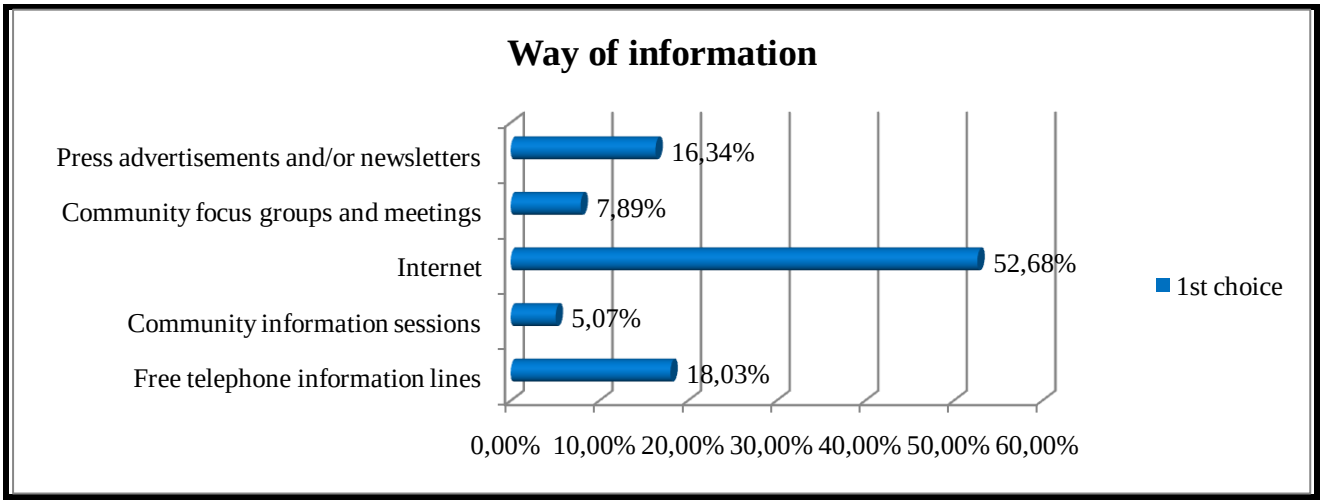

Figure 27: Way of information:
Summarized distribution of results

7.3 Hypothesis testing

In subchapter 7.3 the hypotheses of subchapter 6.3 are going to be test via a multivariate linear regression analysis. Each one of the five variables - *Reuse potentials*, *Benefits*, *Concerns*, *Motives*, *Intention to use* - was set as the dependent variable and as independent variables were set the *Gender*, *Age*, *Income* and *Education*. Detailed ANOVA tables, with the multiple regression analysis of all the dependent variables, are provided in the Appendix 12.5 (Tables 37-41). For reasons of convenience, the Table 4 summarizes the standardized beta coefficients and p-values of all the variables:

Table 4: Coefficients and p-values of demographic variables

Variables	**Gender: Coef.**	**Gender: p-value**	**Age: Coef.**	**Age: p-value**	**Income: Coef.**	**Income: p-value**	**Education: Coef.**	**Education: p-value**
Reuse potentials	0.0419	0.6554	-0.0146	0.7279	0.0410	0.1456	0.1150	0.0166
Benefits	-0.0497	0.3342	0.0068	0.7653	-0.0049	0.7494	0.0759	0.0040
Concerns	-0.2077	0.0004	-0.0041	0.8745	0.0173	0.3233	-0.0134	0.6525
Motives	-0.1880	0.0002	0.0437	0.0512	0.0148	0.3232	-0.0206	0.4209
Intention to use	-0.0235	0.7525	0.0614	0.0657	-0.0041	0.8543	-0.0492	0.1961

In subchapter 6.3 it was explained how the hypotheses are going to be tested and which of them are going to be accepted or rejected. As it is apparent from Table 4, it was found that the variables *Reuse potentials*, *Benefits*, *Concerns* and *Motives* are statistically significant whereas the variable *Intention to use* is statistically insignificant; thus the analysis of coefficients and p-values follows.

Awareness of wastewater reuse potentials is accepted. The alternative $H_1 1$ hypothesis is accepted only for the variable *Education*. With a p-value of 0.0166, there is a positive correlation between the variables *Reuse potentials* and *Education*. The coefficient is 0.1150 and indicates that the greater the education level, the more aware are the consumers about the reuse categories of wastewater.

Agreement with the benefits of using recycled water is accepted. The alternative $H_1 2$ hypothesis is accepted only for the variable *Education*. With a p-value of 0.0040, there is a positive correlation between the variables *Benefits* and *Education*. The coefficient is 0.0759 and indicates that the greater the education level, the higher the level of agreement regarding the benefits from the treatment and reuse of wastewater.

Agreement with the concerns regarding recycled water is accepted. The alternative $H_1$3 hypothesis is accepted only for the variable *Gender*. With a p-value of 0.0004, there is a positive correlation between the variables *Concerns* and *Gender*. The coefficient is -0.2077 and indicates that, between the two genders, female consumers are those who demonstrate a higher level of agreement regarding the concerns about the treatment processes of wastewater and other issues.

Agreement with the motives of acceptance the use of recycled water is accepted. The alternative $H_1$4 hypothesis is accepted only for the variable *Gender*. With a p-value of 0.0002, there is a positive correlation between the variables *Motives* and *Gender*. The coefficient is -0.1880 and indicates that, between the two genders, female consumers are those who demonstrate a higher level of agreement regarding the motives which would urge them to accept recycled water. Nevertheless, although the alternative hypothesis is accepted, the variable *Motives* will not be further analyzed as a hypothesis since it has a Cronbach Alpha of 0.660 or, in other words, below the acceptable level of 0.7.

Disagreement with the potential household uses of recycled water is accepted. The $H_0$5 hypothesis is accepted for all the independent variables. There is not any kind of correlation between the variable *Intention to use* and the independent variables. All of the independent variables have a p-value larger than 0.05. As a result, the specific hypothesis will not be further analyzed. Although the H5 and the previous H4 hypotheses will not be further discussed, the statements, of which each hypothesis consists, are going to be compared in chapter 8 with the findings of other studies. The descriptive statistics of each statement of a question are provided in Appendix 12.4 (Tables 30, 31, 32, 35, 36). The following chapter makes a comparative analysis between the findings of this survey and the findings of other studies.

8. Interpretation of findings (Discussion)

Objectives of this thesis were to provide the technological and theoretical framework regarding wastewater treatment and management in Thessaloniki as well as the level of public knowledge, acceptance and intention to use of recycled water. The findings indicated that the higher the level of education, the more aware were the Greek consumers, regarding the reuse potentials of wastewater; also the level of agreement was higher, as regards to the benefits about recycled water. Furthermore, it was found that females were more concerned, in comparison to men, to use recycled water whereas the intention to use of the latter in domestic activities was irrelevant with the demographic characteristics of the respondents. In other words, the regression analysis showed that only the factor *education* has a positive correlation with the knowledge of Greek consumers about the reuse potentials and the benefits while the factor *gender* has a positive correlation with the concerns about recycled water.

This survey found that the more educated the respondents were, the more agreed with the benefits and concerns about recycled water (Table 37). This is consistent with the findings of other studies (Baumann, 1983; Dolnicar & Saunders, 2006) where, the more knowledgeable and educated a person is the more favorable is towards recycled water. The higher the education of a person, the stronger recycled water accepter is (Dolnicar & Schäfer, 2009). The more knowledge a person has, the greater the likelihood of using recycled water (Dolnicar et al., 2011). Madany et al. (1992) found that the knowledge of respondents about wastewater has positive relationship only with the level of education and age whereas this survey found that only education is statistically significant.

This survey introduces respondents' agreement (50.70%) as concerns to the fact that "recycled water reduces the dependence of expensive water storages" is pretty high (Table 31). This is consistent with the finding of Baumann (1983) that if water supply is considered inadequate by consumers, then the level of acceptance is increased. Almost 48% and 51% of the sample agreed that recycled water reduces coastal marine pollution and discharge of wastewater to sensitive areas (Table 31), findings in compliance with those of Dolnicar & Schäfer (2009). The latter also found that recycled water is most environmentally responsible resource and increases the amount of fresh water. With the statements that recycled water is a reliable and sustainable source of water and it reduces demand for fresh water the 71% and 78% of respondents respectively agreed or totally agreed (Table 31).

This survey found that, compared to other concerns, price of recycled water was not a major concern (11.83%) of its acceptance (Table 32). Former studies found price of recycled water as an insignificant determinant (Baumann 1983). Only approximately 11% of respondents totally agreed that not even an increase in the conventional sources of water would urge them to use recycled water (Table 32), a similar finding with that of Dolnicar & Saunders (2006). 80% of the sample agreed or totally agreed with the concern about recycled water's quality (Table 32), a similar finding that other studies have spotted (Dolnicar & Saunders, 2006; Higgins et al., 2002). A 73% of sample agreed or totally agreed with the concern that water activities might involve physical contact (Table 32), a finding that agree with previous ones (Friedler et al., 2006; Madany et al., 1992) where the low contact reuse options (i.e. crop irrigation) had greater support compared to opposition about high contact options (i.e. domestic laundry).

This survey found that respondents' motivation to use recycled water would be increased if the information would be simple, clear, reliable (42.25%) accurate, detailed and on-going (41.13%) (Table 35), something that is consistent with previous studies (Baumann, 1983; Hartley, 2006; Hurlimann et al., 2008; Urkiaga et al., 2006) where the more information about the distribution and treatment system of wastewater would increase consumers' acceptance. Only 5% would get influenced by other people (Table 35) and a similar low percentage was found by Dolnicar et al. (2011). An also low percentage regarding environmental attitudes found the latter authors whereas this survey found that 44% would be motivated if the protection of the environment was a clear benefit (Table 35). The greatest motivation (58%) to use recycled water was found to be "the protection of public health is clear" (Table 35), a similar finding with previous studies (Hartley, 2006). However, in contrast with the finding of the latter, this survey found that only 10% would have the motivation to use recycled water, even if it was from their own wastewater (Table 35).

This survey found that, among the household/domestic uses of recycled-non potable-water, the majority of respondents (72.68%) would intend to use it in toilet flushing, in garden watering (45.07%), in dish washer (18.31%), in car washing (59.15%), in laundry machine (14.93%), in general cleaning (39.44) and the minority of them (4.51%) would use it in showering (Table 36). Former studies found that consumers would use it in a similar descending order in toilet flushing (90%), in garden watering (89%) and the minority of them (40%) would use it in showering (Dolnicar & Schäfer, 2009). When it came to non ingestion of recycled water, the acceptance was being increased from 50% to 80% and to 95% when there was no

bodily contact whatsoever (Baumann, 1983). The following chapter discusses the limitations of this dissertation.

9. Limitations

In Chapter 9 of the dissertation all the limitations and restrictions of the present thesis are going to be cited. First of all, the survey was restricted in the city of Thessaloniki which is the second, in population, city of Greece. There are many other cities across the country, such as Larissa, Kavala, Athens etc., where the effluents are treated equally satisfactorily and reused and it would beneficial, for scientific purposes, to learn consumers' attitudes and knowledge of these cities. A second limitation is the sample size. Although the sample (n=355) was adequate enough and the questionnaires distributed to the majority of the municipalities of the city, yet a larger and more geographically diversified sample would be better since it could provide more reliable data and perhaps a higher Cronbach Alpha.

Another limitation is that the demographic data, although typically they included percentages from all the potential categories, quantitatively the distribution of the percentages was dissimilar. For instance, as regards to the variable "Education", the 73.24% (40.28+32.96) of the respondents had a higher education and the remaining percentage was of lower education. Therefore a more diversified sample could have provided such kind of data that would perhaps enhance, to a greater extent, the accepted hypotheses by including more independent variables with p-values lower than 0.05. A fourth limitation is the mean score of the five variables examined in subchapter 8.2. With the exception of the first variable with the mean score of 2.8859, all the other variables had a mean score between the range 3.6600 and 3.9900. A larger sample of Greek consumers could have provided more diversified scores between the range of 1.0000 and 5.0000. The following chapter provides the conclusions of this dissertation and some recommendations based on the interpretation of findings in chapter 8.

10. Conclusion and Recommendations

As many countries worldwide try to cope with the problem of water shortage, they resort to solutions of either water conservation actions or water production from alternative water sources such as treated sewage effluents/wastewater. Purpose of this thesis was to provide the technological and legal framework that is currently applied in Greece and specifically in Thessaloniki as well as to reveal the level of public knowledge, awareness and acceptance of recycled water for potential household activities. Briefly this thesis found that there is a positive correlation between knowledge and awareness of recycled water and education level. The higher the level of education, the more favorable the person is towards recycled water. The respondents agreed that the greatest benefit of wastewater treatment is that the overuse of fresh water sources is reduced and thus more fresh water is available to them. The respondents agreed that their greatest concern is the level of sewage effluents' treatment. The respondents agreed that the clarification of the matter of the safety and protection of public health would the utmost motive for them to use recycled water. The respondents also have greater intention to use the latter in domestic activities that do not involve physical contact and less intention when physical contact increases.

Based on these findings, some recommendations can be made as regards to ways of increasing the awareness and acceptance of recycled water. To that end, a vast majority of empirical studies has been conducted about consumers' likelihood of accepting and using recycled water but all of them studied behavioral intention and not actual intention since they used hypothetical questions (Baumann, 1983; Friedler et al., 2006; Hartley, 2006; Hurlimann et al., 2009). It should be highlighted that half of the respondents would trust a health or water authority in order to learn on recycled water as well as half of the sample would choose internet as the most convenient way of received information, so these channels of communication and source of information should be chosen (subchapter 7.2). Consumers have theoretically a positive perception about reclaimed water but when it comes to practice they display the opposite behavior. This can be attributed to the fact that, with the exception of the last drought that Greece encountered in 2007, Greek consumers had never felt "water restricted". In that case the measurement of the aforementioned actual behavior would be a possible scenario and the proposed recommendations would be more applicable. This means that although consumers demonstrate an aversion to recycled water when this involves activities of high physical contact, their perceptions might be different if there was a real case of water shortage and, in that case, they might prioritize in the opposite order the uses of recycled water to domestic activities.

Therefore, since consumers have only a general idea and positive perception about recycled water, public participation is the best way for the promotion of the specific concept. First of all, there should be a closer cooperation among the health and water authorities. It was presented the high acceptance the project of EYATH had on farmers and this, in turn, can lead to the expansion of the use to household activities. Urkiaga et al. (2006) mentions that the greater amount of sewage effluents is treated, the more cost-effective a project is. On this basis EYATH, in cooperation with the relevant ministry, can increase the amount of treated wastewater so it can be offered, primarily, for free in toilet flushing and car/vehicle washing. Due to the fact that the specific domestic activities involve no physical contact and according to the stated intention to use, it is very likely that recipients will accept it. In that case they will start becoming more familiar with it and possibly more favorable to expand its usage to other "high contact" activities. The key-factor is the creation to consumers of the feeling of trust to health or water authorities; if these authorities manage to ensure that the level of treatment is the proper one for household activities, then they can make consumers overcome their greatest concerns.

Regarding the way of communication, internet is the way that consumers choose to get informed. Internet has many advantages: it reduces information asymmetries and enables customers to have access to more information 24 hours per day (Kotler et al., 2009, p. 121). Since respondents agreed that the provided information about recycled water should be simple, accurate, reliable and on-going, internet is the way of communication that fulfills all the characteristics. The creation, on behalf of water and health authorities, of a new and independent website where consumers could learn more about reclaimed water and constantly control the received information, through an interactive communication, can be a feasible and effective way public awareness and acceptance to be increased.

All in all, since *education* and *gender* are the only factors that have a correlation with knowledge and reservations about recycled water, emphasis should be placed to these factors. Even if they have an indirect effect on intention to use of recycled water, since no other demographic criterion was found significant to affect the intention to use of it, they still can be valuable to promotion activities. If the more *educated* people would be persuaded, since they are aware of the reuse potentials and the benefits, to start using recycled water, their experiences could be placed on the aforementioned website and be seen by other people. Apart from the constant and updated information the website will provide, these experiences would be an extra motivation to the people who would use the website to learn more and gradually adopt it in

some domestic activities. As regards to the gender, *female* are usually responsible for the housekeeping. The reliable and on-going information which will be provided by the relevant website, the reading of experiences of consumers who used this type of water as well as the ensuring that public health is protected, all these can be reasons females to reduce their reservations and, at the same time, indirectly started to consider the possibility of using recycled water, at first on low contact activities (i.e. toilet flushing). In turn, the other members of the family can possibly follow the same procedure. The following chapter provides all the references and the last chapter provides all the appendices of this dissertation.

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12. Appendices

12.1 Questionnaire (English version)

ANONYMOUS QUESTIONNAIRE
Subject: Water Resource Management and Public Perception in Greece
Dear Sir/Madam, My name is Konstantinos Takolas. This questionnaire is about my MSc thesis regarding wastewater treatment, reuse and concerns in Greece. In the following questions, when we refer to recycled water, we refer to water that has been treated properly so that it can be used in different household activities but it cannot be used for drinking. The questions are multiple choice and all of them have to be answered. The questionnaire is anonymous! Thank you for your time!
* Required

REUSE POTENTIALS

1. Below there is a list of categories where wastewater can be reused. Please state your level of awareness or unawareness regarding the categories: *

	Very aware	Aware	Neither aware nor unaware	Unaware	Completely unaware
Agricultural irrigation (i.e. crop irrigation)	○	○	○	○	○
Landscape irrigation (i.e. school yard, park)	○	○	○	○	○
Industrial reuse (i.e. cooling, heavy construction)	○	○	○	○	○
Groundwater recharge (i.e. groundwater replenishment)	○	○	○	○	○
Recreational and environmental uses (i.e. lakes/ponds, snowmaking)	○	○	○	○	○
Non-potable urban uses (i.e. fire protection, air conditioning)	○	○	○	○	○

BENEFITS

2. Below you can find a list of benefits of using recycled water. Please state your level of agreement or disagreement with the following statements: *

	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
It is a constant, reliable and sustainable source of water	○	○	○	○	○
It improves the nutrient	○	○	○	○	○

	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
balance of underutilized land (i.e. fallow area)					
It can reduce overuse/demand for fresh water sources	○	○	○	○	○
It can reduce effluent discharge to surface waters, lakes, rivers	○	○	○	○	○
It can contribute to economic development and tourism	○	○	○	○	○
It can reduce coastal marine pollution	○	○	○	○	○
Nutrients present in recycled water can be used as a fertilizer source	○	○	○	○	○
It can reduce the dependence on expensive water storages	○	○	○	○	○

CONCERNS

3. Below you can see a list of concerns regarding recycled water. Please state your level of agreement or disagreement: "I am concerned about: *

	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
The level of treatment of the recycled water"	○	○	○	○	○
Health problem due to accidental consumption (i.e. recycled water is not treated for drinkable purpose)"	○	○	○	○	○
Price of the recycled water"	○	○	○	○	○
Presence of pathogenic microorganisms in wastewater (i.e. viruses, bacteria, protozoa)"	○	○	○	○	○
Quality of recycled water"	○	○	○	○	○
Specific water activities	○	○	○	○	○

	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
that involve physical contact (i.e. showering)"					
The implementation of regulations about wastewater treatment by water authorities"					

SOURCE OF INFORMATION

4. Below there is a list of sources of information regarding recycled water. Please rank them from the most preferable (1st choice) to the least preferable (5th choice): *

	1st choice	2nd choice	3rd choice	4th choice	5th choice
A health authority (i.e. Ministry of Health and Social Solidarity) and/or a water authority (i.e. EYATH)					
A manager and/or an operator of a wastewater treatment facility					
Media (i.e. TV, magazines)					
A university/professional expert					
A family member					

CONTROL OF RECEIVED INFORMATION

5. Below you can find a list of ways of information regarding recycled water. Please rank them from the most convenient (1st choice) to the least convenient (5th choice): *

	1st choice	2nd choice	3rd choice	4th choice	5th choice
Free telephone information lines					
Community information sessions					
Internet (i.e. web sites)					
Community focus groups and meetings					
Press advertisements and/or newsletters					

MOTIVES

6. Below you see a list of motives regarding acceptance of recycled water. Please state your level of agreement or disagreement: "I would use recycled water in case: *

	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
The provided information is simple, clear and reliable"	○	○	○	○	○
The provided information is detailed, timely, accurate and on-going"	○	○	○	○	○
The provided information include all the different benefits of recycled water"	○	○	○	○	○
There would be an increase in price of conventional water sources"	○	○	○	○	○
The recycled water was from my own wastewater than from a public source"	○	○	○	○	○
The protection of public health is clear"	○	○	○	○	○
I get influenced by a public campaign and/or other people"	○	○	○	○	○
The protection of the environment is a clear benefit of the reuse"	○	○	○	○	○

INTENTION TO USE

7. Below there is a list of potential household - but not for drinkable purpose - uses of recycled water. Please state your level of agreement or disagreement: "I could use recycled water in: *

	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Toilet flushing"	○	○	○	○	○
Lawn/Garden watering (i.e. vegetables)"	○	○	○	○	○
Dish washer"	○	○	○	○	○
Car/Vehicle washing"	○	○	○	○	○

	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Showering"					
Laundry machine"					
General cleaning (i.e. windows)"					

DEMOGRAPHICS

8. What is your gender? *

- Male
- Female

9. What is your age? *

- 18-29
- 30-39
- 40-49
- 50-59
- 60 and above

10. What is your personal annual income? *

- Less than €5.000
- €5.001 to €12.000
- €12.001 to €19.000
- €19.001 to €26.000
- €26.001 to €33.000
- €33.001 to €40.000
- €40.001 to €47.000
- €47.001 to €54.000
- €54.001 to €61.000
- €61.001 and/or above

11. What is your level of education? *

- Secondary education
- Technological education
- Holder of a university degree
- Holder of a master degree/Ph.D.

12.2 Questionnaire (Greek version)

Ανώνυμο Ερωτηματολόγιο
Θέμα: ΔΙΑΧΕΙΡΗΣΗ ΥΔΑΤΙΝΩΝ ΠΟΡΩΝ ΚΑΙ ΔΗΜΟΣΙΑ ΑΝΤΙΛΗΨΗ ΣΤΗΝ ΕΛΛΑΔΑ
Αγαπητέ ΚΥΡΙΕ / ΚΥΡΙΑ, Ονομάζομαι Τακόλας Κωνσταντίνος και είμαι μεταπτυχιακός φοιτητής του ΠΜΣ στη Διοίκηση του Διεθνούς Πανεπιστημίου Ελλάδος. Στο πλαίσιο της διπλωματικής εργασίας οικοδόμησα ερωτηματολόγιο που αφορά στην επεξεργασία των υγρών λυμάτων και τις προοπτικές επαναχρησιμοποίησης τους στην Ελλάδα. Στις ερωτήσεις που ακολουθούν, με τον όρο ανακυκλωμένο νερό, αναφερόμαστε στο νερό που έχει υποστεί κατάλληλη επεξεργασία και είναι δυνατό να χρησιμοποιηθεί σε διάφορες δραστηριότητες ενός νοικοκυριού. Σημειώνεται ότι το επεξεργασμένο νερό ΔΕΝ μπορεί να χρησιμοποιηθεί ως πόσιμο νερό. Οι ερωτήσεις είναι πολλαπλής επιλογής και όλες πρέπει να απαντηθούν. Το ερωτηματολόγιο είναι ανώνυμο! Σας ευχαριστώ για το χρόνο σας!
* Απαιτείται

ΔΥΝΑΤΟΤΗΤΕΣ ΕΠΑΝΑΧΡΗΣΙΜΟΠΟΙΗΣΗΣ

1. Παρακάτω υπάρχει ένας κατάλογος των κατηγοριών λυμάτων που είναι δυνατό να επαναχρησιμοποιηθούν. Παρακαλώ αναφέρετε το επίπεδο της επίγνωσης ή της άγνοιας σας σχετικά με τις κατηγορίες: *

	Πολύ ενήμερος	Ενήμερος	Ούτε ενήμερος ούτε απληροφόρητος	Απληροφόρητος	Αρκετά απληροφόρητος
Γεωργική άρδευση (π.χ. άρδευση σοδειάς)	○	○	○	○	○
Άρδευση Τοπίου (π.χ. σχολική αυλή, πάρκο)	○	○	○	○	○
Βιομηχανική επαναχρησιμοποίηση (π.χ. ψύξη, βαριά κατασκευή)	○	○	○	○	○
Επαναπλήρωση των υπόγειων υδάτων (π.χ. αναπλήρωση των υπόγειων υδάτων)	○	○	○	○	○
Ψυχαγωγικές και περιβαλλοντικές χρήσεις (π.χ. λίμνες / νερόλακκοι, παραγωγή χιονιού)	○	○	○	○	○
Μη πόσιμες αστικές χρήσεις (π.χ. πυρασφάλεια, κλιματισμός)	○	○	○	○	○

ΟΦΕΛΗ

2. Παρακάτω μπορείτε να βρείτε μια λίστα με τα οφέλη από τη χρήση ανακυκλωμένου νερού. Παρακαλώ αναφέρετε το επίπεδο της συμφωνίας ή της διαφωνίας σας με τις ακόλουθες δηλώσεις: *

	Συμφωνώ απόλυτα	Συμφωνώ	Ούτε συμφωνώ, ούτε διαφωνώ	Διαφωνώ	Διαφωνώ απόλυτα
Πρόκειται για μια σταθερή, αξιόπιστη και βιώσιμη πηγή νερού	○	○	○	○	○
Βελτιώνει την ισορροπία θρεπτικών συστατικών της υποχρησιμοποιούμενης γης (π.χ. χέρσα γη)	○	○	○	○	○
Μειώνει την υπερβολική χρήση / ζήτηση για πηγές γλυκού νερού	○	○	○	○	○
Μειώνει την διοχέτευση λυμάτων στα επιφανειακά ύδατα, λίμνες, ποτάμια	○	○	○	○	○
Συμβάλει στην οικονομική ανάπτυξη και τον τουρισμό	○	○	○	○	○
Μειώνει την παράκτια θαλάσσια ρύπανση	○	○	○	○	○
Τα θρεπτικά συστατικά που υπάρχουν στο ανακυκλωμένο νερό χρησιμοποιούνται ως πηγή λιπάσματος	○	○	○	○	○
Μειώνει την εξάρτηση από ακριβές αποθήκες νερού	○	○	○	○	○

ΑΝΗΣΥΧΙΕΣ

3. Παρακάτω μπορείτε να δείτε μια λίστα των ανησυχιών σχετικά με το ανακυκλωμένο νερό. Παρακαλώ αναφέρετε το επίπεδο της συμφωνίας ή της διαφωνίας σας: "Ανησυχώ για *

	Συμφωνώ απόλυτα	Συμφωνώ	Ούτε συμφωνώ, ούτε διαφωνώ	Διαφωνώ	Διαφωνώ απόλυτα
το επίπεδο της επεξεργασίας του ανακυκλωμένου νερού"	○	○	○	○	○
το πρόβλημα υγείας που οφείλεται στην τυχαία κατανάλωση (π.χ. το ανακυκλωμένο νερό δεν επεξεργάζεται για	○	○	○	○	○

	Συμφωνώ απόλυτα	Συμφωνώ	Ούτε συμφωνώ, ούτε διαφωνώ	Διαφωνώ	Διαφωνώ απόλυτα
πόσιμο σκοπό)"					
τη τιμή του ανακυκλωμένου νερού"	○	○	○	○	○
την παρουσία παθογόνων μικροοργανισμών στα λύματα (π.χ. ιοί, βακτηρίδια, πρωτόζωα)"	○	○	○	○	○
την ποιότητα του ανακυκλωμένου νερού"	○	○	○	○	○
τις ειδικές δραστηριότητες που αφορούν σωματική επαφή με το νερό (π.χ. ντουζ)"	○	○	○	○	○
την εφαρμογή των κανονισμών σχετικά με την επεξεργασία των λυμάτων από τις αρμόδιες αρχές του νερού"	○	○	○	○	○

ΠΗΓΗ ΠΛΗΡΟΦΟΡΗΣΗΣ

4. Παρακάτω υπάρχει ένας κατάλογος των πηγών πληροφόρησης σχετικά με το ανακυκλωμένο νερό. Παρακαλώ να τις κατατάξετε από την περισσότερο προτιμητέα (1η επιλογή) έως την λιγότερο προτιμητέα (5η επιλογή) για εσάς: *

	1η επιλογή	2η επιλογή	3η επιλογή	4η επιλογή	5η επιλογή
Υγειονομική αρχή (π.χ. Υπουργείο Υγείας και Κοινωνικής Αλληλεγγύης) και/ή μία αρμόδια αρχή του νερού (π.χ. ΕΥΑΘ)	○	○	○	○	○
Διευθυντής ή/και ο διαχειριστής εκμετάλλευσης μιας εγκατάστασης επεξεργασίας λυμάτων	○	○	○	○	○
Μέσα ενημέρωσης (π.χ. τηλεόραση, περιοδικά)	○	○	○	○	○
Πανεπιστημιακός / επαγγελματίας εμπειρογνώμων	○	○	○	○	○

	1η επιλογή	2η επιλογή	3η επιλογή	4η επιλογή	5η επιλογή
Μέλος της οικογένειας	○	○	○	○	○

ΕΛΕΓΧΟΣ ΤΩΝ ΛΑΜΒΑΝΟΜΕΝΩΝ ΠΛΗΡΟΦΟΡΙΩΝ

5. Παρακάτω μπορείτε να βρείτε μια λίστα με τρόπους πληροφόρησης σχετικά με το ανακυκλωμένο νερό. Παρακαλώ να τους κατατάξετε από τον περισσότερο βολικό (1η επιλογή) έως τον λιγότερο βολικό (5η επιλογή) για εσάς: *

	1η επιλογή	2η επιλογή	3η επιλογή	4η επιλογή	5η επιλογή
Δωρεάν τηλεφωνική παροχή πληροφοριών	○	○	○	○	○
Ενημερωτικές συνεδρίες του δήμου	○	○	○	○	○
Διαδίκτυο (π.χ. ιστοσελίδες)	○	○	○	○	○
Συναντήσεις και ομάδες συμμετοχής του δήμου	○	○	○	○	○
Διαφημίσεις του Τύπου και/ή ενημερωτικά δελτία	○	○	○	○	○

ΚΙΝΗΤΡΑ

6. Παρακάτω μπορείτε να δείτε μια λίστα με τα κίνητρα όσον αφορά την αποδοχή του ανακυκλωμένου νερού. Παρακαλώ αναφέρετε το επίπεδο της συμφωνίας ή της διαφωνίας σας: "Θα μπορούσα να χρησιμοποιήσω ανακυκλωμένο νερό εάν: *

	Συμφωνώ απόλυτα	Συμφωνώ	Ούτε συμφωνώ, ούτε διαφωνώ	Διαφωνώ	Διαφωνώ απόλυτα
οι πληροφορίες που παρέχονται είναι απλές, σαφής και αξιόπιστες"	○	○	○	○	○
οι πληροφορίες που παρέχονται είναι λεπτομερείς, ακριβείς και συνεχιζόμενες"	○	○	○	○	○
οι πληροφορίες που παρέχονται περιλαμβάνουν όλα τα διαφορετικά οφέλη του ανακυκλωμένου νερού"	○	○	○	○	○
υπάρξει αύξηση στην τιμή των συμβατικών πηγών νερού"	○	○	○	○	○
το ανακυκλωμένο νερό ήταν από λύματα του σπιτιού μου και όχι από	○	○	○	○	○

	Συμφωνώ απόλυτα	Συμφωνώ	Ούτε συμφωνώ, ούτε διαφωνώ	Διαφωνώ	Διαφωνώ απόλυτα
δημόσια πηγή"					
η προστασία της δημόσιας υγείας είναι σαφής"	○	○	○	○	○
έχω επηρεαστεί από δημόσια εκστρατεία ή/και άλλους ανθρώπους"	○	○	○	○	○
η επαναχρησιμοποίηση αποτελεί σαφές όφελος για την προστασία του περιβάλλοντος"	○	○	○	○	○

ΠΡΟΘΕΣΗ ΓΙΑ ΧΡΗΣΙΜΟΠΟΙΗΣΗ

7. Παρακάτω υπάρχει μια λίστα των πιθανών οικιακών - αλλά όχι για πόσιμο σκοπό - χρήσεων του ανακυκλωμένου νερού. Παρακαλώ αναφέρετε το επίπεδο της συμφωνίας ή της διαφωνίας σας: "Θα μπορούσα να χρησιμοποιήσω ανακυκλωμένο νερό στις παρακάτω περιπτώσεις/δραστηριότητες: *

	Συμφωνώ απόλυτα	Συμφωνώ	Ούτε συμφωνώ, ούτε διαφωνώ	Διαφωνώ	Διαφωνώ απόλυτα
Καζανάκι της τουαλέτας"	○	○	○	○	○
Πότισμα του κήπου / γκαζόν (π.χ. λαχανικά)"	○	○	○	○	○
Πλυντήριο πιάτων"	○	○	○	○	○
Πλύσιμο αυτοκινήτου / οχήματος	○	○	○	○	○
Ντους"	○	○	○	○	○
Πλυντήριο ρούχων"	○	○	○	○	○
Γενικός καθαρισμός (π.χ. παράθυρα)"	○	○	○	○	○

ΔΗΜΟΓΡΑΦΙΚΑ

8. Ποιό είναι το φύλο σας; *

- ○ Άντρας
- ○ Γυναίκα

9. Ποια είναι η ηλικία σας; *

- ○ 18-29

- 30-39
- 40-49
- 50-59
- 60 και άνω

10. Ποιό είναι το προσωπικό ετήσιο εισόδημά σας; *
    - Λιγότερο από €5.000
    - €5.001 με €12.000
    - €12.001 με €19.000
    - €19.001 με €26.000
    - €26.001 με €33.000
    - €33.001 με €40.000
    - €40.001 με €47.000
    - €47.001 με €54.000
    - €54.001 με €61.000
    - €61.001 και άνω

11. Ποιο είναι το επίπεδο μόρφωσής σας; *
    - Δευτεροβάθμια εκπαίδευση
    - Τεχνολογική εκπαίδευση
    - Κάτοχος πανεπιστημιακού πτυχίου
    - Κάτοχος μεταπτυχιακού / διδακτορικού

12.3 Reliability Test Results

RELIABILITY

Scale: ALL VARIABLES= Potentials1 Potentials2 Potentials3 Potentials4 Potentials5 Potentials6

Table 5: Case Processing Summary of Question 1

		N	%
Cases	Valid	355	100.0
	Excluded[a]	0	.0
	Total	355	100.0

a. Listwise deletion based on all variables in the procedure.

Table 6: Reliability Statistics of Question 1

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.873	.873	6

Table 7: Item Statistics of Question 1

	Mean	Std. Deviation	N
Potentials1	3.0704	1.15866	355
Potentials2	2.9324	1.11281	355
Potentials3	2.8732	1.16844	355
Potentials4	2.5662	1.11385	355
Potentials5	2.9296	1.09343	355
Potentials6	2.9437	1.10068	355

Table 8: Item-Total Statistics of Question 1

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Correlated Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Potentials1	14.2451	19.406	.694	.589	.847
Potentials2	14.3831	19.638	.705	.596	.845
Potentials3	14.4423	19.547	.670	.460	.852
Potentials4	14.7493	20.352	.621	.415	.860
Potentials5	14.3859	19.876	.693	.564	.848
Potentials6	14.3718	20.104	.660	.527	.853

Table 9: Scale Statistics of Question 1

Mean	Variance	Std. Deviation	N of Items
17.3155	27.832	5.27564	6

RELIABILITY

Scale: ALL VARIABLES=Benefits1 Benefits2 Benefits3 Benefits4 Benefits5 Benefits6 Benefits7 Benefits8

Table 10: Case Processing Summary of Question 2

		N	%
Cases	Valid	355	100.0
	Excluded[a]	0	.0
	Total	355	100.0

a. Listwise deletion based on all variables in the procedure.

Table 11: Reliability Statistics of Question 2

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.731	.737	8

Table 12: Item Statistics of Question 2

	Mean	Std. Deviation	N
Benefits1	3.8676	.82472	355
Benefits2	2.7775	.90420	355
Benefits3	4.0028	.86520	355
Benefits4	4.0338	.72407	355
Benefits5	3.6761	.83657	355
Benefits6	4.0366	.77846	355
Benefits7	3.5972	.79440	355
Benefits8	3.9408	.79504	355

Table 13: Item-Total Statistics of Question 2

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Correlated Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Benefits1	26.0648	12.151	.347	.129	.719
Benefits2	27.1549	12.086	.306	.124	.730
Benefits3	25.9296	11.331	.471	.356	.694
Benefits4	25.8986	11.312	.614	.453	.670
Benefits5	26.2563	11.920	.382	.209	.713
Benefits6	25.8958	11.534	.508	.378	.688
Benefits7	26.3352	12.382	.324	.134	.723
Benefits8	25.9915	11.579	.483	.296	.692

Table 14: Scale Statistics of Question 2

Mean	Variance	Std. Deviation	N of Items
29.9324	14.826	3.85044	8

CHAPTER 12

RELIABILITY

Scale: ALL VARIABLES=Concerns1 Concerns2 Concerns3 Concerns4 Concerns5 Concerns6 Concerns7

Table 15: Case Processing Summary of Question 3

		N	%
Cases	Valid	355	100.0
	Excluded[a]	0	.0
	Total	355	100.0

a. Listwise deletion based on all variables in the procedure.

Table 16: Reliability Statistics of Question 3

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.801	.802	7

Table 17: Item Statistics of Question 3

	Mean	Std. Deviation	N
Concerns1	4.1042	.70739	355
Concerns2	4.0169	.79883	355
Concerns3	3.5099	.84825	355
Concerns4	4.1324	.86157	355
Concerns5	4.0817	.83806	355
Concerns6	3.9070	.85690	355
Concerns7	4.1577	.76129	355

Table 18: Item-Total Statistics of Question 3

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Correlated Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Concerns1	23.8056	11.598	.544	.342	.774
Concerns2	23.8930	10.887	.606	.437	.761
Concerns3	24.4000	12.444	.260	.091	.824
Concerns4	23.7775	10.343	.656	.562	.751
Concerns5	23.8282	10.425	.664	.533	.749
Concerns6	24.0028	10.822	.561	.375	.770
Concerns7	23.7521	11.701	.468	.288	.786

Table 19: Scale Statistics of Question 3

Mean	Variance	Std. Deviation	N of Items
27.9099	14.721	3.83675	7

RELIABILITY

Scale: ALL VARIABLES=Motives1 Motives2 Motives3 Motives4 Motives5 Motives6 Motives7 Motives8

Table 20: Case Processing Summary of Question 6

		N	%
Cases	Valid	355	100.0
	Excluded[a]	0	.0
	Total	355	100.0

a. Listwise deletion based on all variables in the procedure.

Table 21: Reliability Statistics of Question 6

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.660	.683	8

Table 22: Item Statistics of Question 6

	Mean	Std. Deviation	N
Motives1	4.2620	.76402	355
Motives2	4.2254	.81645	355
Motives3	4.0986	.76570	355
Motives4	3.2028	1.07014	355
Motives5	3.1239	1.03954	355
Motives6	4.4732	.71800	355
Motives7	3.0394	1.01882	355
Motives8	4.2761	.74209	355

Table 23: Item-Total Statistics of Question 6

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Correlated Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Motives1	26.4394	11.433	.499	.370	.597
Motives2	26.4761	11.521	.434	.336	.610
Motives3	26.6028	11.189	.550	.394	.585
Motives4	27.4986	11.189	.316	.145	.643
Motives5	27.5775	11.465	.291	.155	.649
Motives6	26.2282	12.386	.335	.217	.634
Motives7	27.6620	11.908	.234	.103	.664
Motives8	26.4254	12.641	.266	.134	.648

Table 24: Scale Statistics of Question 6

Mean	Variance	Std. Deviation	N of Items
30.7014	14.594	3.82024	8

CHAPTER 12

RELIABILITY

Scale: ALL VARIABLES=Intention1 Intention2 Intention3 Intention4 Intention5 Intention6 Intention7

Table 25: Case Processing Summary of Question 7

		N	%
Cases	Valid	355	100.0
	Excluded[a]	0	.0
	Total	355	100.0

a. Listwise deletion based on all variables in the procedure.

Table 26: Reliability Statistics of Question 7

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.779	.763	7

Table 27: Item Statistics of Question 7

	Mean	Std. Deviation	N
Intention1	4.6169	.72075	355
Intention2	4.0958	1.02061	355
Intention3	3.0366	1.29375	355
Intention4	4.3831	.90494	355
Intention5	2.4789	1.11562	355
Intention6	2.9831	1.26881	355
Intention7	4.0366	1.00074	355

Table 28: Item-Total Statistics of Question 7

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Correlated Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Intention1	21.0141	21.681	.238	.174	.791
Intention2	21.5352	20.148	.285	.126	.791
Intention3	22.5944	14.971	.715	.640	.700
Intention4	21.2479	20.119	.352	.252	.777
Intention5	23.1521	17.214	.577	.503	.735
Intention6	22.6479	15.110	.718	.694	.700
Intention7	21.5944	17.660	.611	.437	.731

Table 29: Scale Statistics of Question 7

Mean	Variance	Std. Deviation	N of Items
25.6310	23.798	4.87837	7

12.4 Descriptive Statistics Results

Table 30: Descriptive Statistics of statements of Question 1

Question 1	Very aware	Aware	Neither aware nor unaware	Unaware	Completely unaware
Agricultural irrigation	8.45%	35.21%	21.41%	24.79%	10.14%
Landscape irrigation	7.04%	27.61%	26.76%	28.73%	9.86%
Industrial reuse	9.58%	21.97%	26.48%	30.14%	11.83%
Groundwater recharge	5.92%	16.06%	22.54%	39.72%	15.77%
Recreational uses	5.63%	30.14%	25.07%	29.86%	9.30%
Non-potable uses	6.76%	28.73%	25.35%	30.42%	8.73%

Table 31: Descriptive Statistics of statements of Question 2

Question 2	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
It is a sustainable source of water	21.69%	49.58%	22.82%	5.63%	0.28%
It improves nutrient balance of underutilized land	2.25%	18.31%	41.41%	30.99%	7.04%
It reduces demand for fresh water	29.01%	49.86%	14.37%	5.92%	0.85%
It reduces effluent discharge to lakes	26.76%	50.99%	21.13%	1.13%	0.00%
It contributes to economic development	16.62%	40.85%	36.90%	4.79%	0.85%
It reduces coastal marine pollution	29.30%	47.89%	20.00%	2.82%	0.00%
It is used as fertilizer source	12.68%	40.00%	42.82%	3.38%	1.13%
It reduces dependence of expensive water storages	23.94%	50.70%	21.13%	3.94%	0.28%

Table 32: Descriptive Statistics of statements of Question 3

Question 3	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
The level of treatment of recycled water	27.04%	59.72%	10.14%	2.82%	0.28%
Health problem due to accidental consumption	26.20%	55.21%	13.24%	4.79%	0.56%
Price of the recycled water	11.83%	38.31%	39.44%	9.86%	0.56%
Presence of pathogenic microorganisms in wastewater	36.90%	46.48%	10.14%	5.92%	0.56%
Quality of recycled water	33.24%	47.61%	13.52%	5.35%	0.28%
Activities involving physical contact with recycled water	24.23%	49.58%	19.72%	5.63%	0.85%
The implementations of regulations about wastewater treatment	35.49%	47.32%	14.65%	2.54%	0.00%

Table 33: Descriptive Statistics of statements of Question 4

Question 4	1st choice	2nd choice	3rd choice	4th choice	5th choice
A health or water authority	50.42%	25.92%	10.70%	6.20%	6.76%
A manager/operator of a wastewater treatment plant	5.63%	18.31%	38.03%	23.94%	14.08%
Media	13.52%	15.21%	17.75%	33.80%	19.72%
A university/professional expert	25.63%	32.39%	18.59%	14.08%	9.30%
A family member	4.79%	8.17%	14.93%	21.97%	50.14%

Table 34: Descriptive Statistics of statements of Question 5

Question 5	1st choice	2nd choice	3rd choice	4th choice	5th choice
Free telephone information lines	18.03%	19.72%	25.07%	13.52%	23.66%
Community information sessions	5.07%	18.31%	21.13%	36.34%	19.15%
Internet	52.68%	19.15%	12.39%	8.45%	7.32%
Community focus groups	7.89%	10.99%	21.13%	27.04%	32.96%
Press advertisements	16.34%	31.83%	20.28%	14.65%	16.90%

Table 35: Descriptive Statistics of statements of Question 6

Question 6	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
Provided information is clear and reliable	42.25%	44.51%	10.99%	1.69%	0.56%
Provided information is detailed and on-going	41.13%	45.35%	9.30%	3.38%	0.85%
Provided information includes recycled water's benefits	30.99%	50.99%	15.49%	1.97%	0.56%
There would be an increase in water's conventional prices	10.70%	32.39%	28.17%	23.94%	4.79%
The recycled water is from my own wastewater	10.42%	24.23%	38.03%	21.97%	5.35%
The protection of public health is clear	58.03%	33.52%	6.48%	1.69%	0.28%
Get influenced by a public campaign	5.35%	29.86%	36.06%	20.85%	7.89%
Protection of environment is a clear benefit of the reuse	43.94%	40.85%	14.08%	1.13%	0.00%

Table 36: Descriptive Statistics of statements of Question 7

Question 7	I totally agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
Toilet flushing	72.68%	18.87%	6.48%	1.41%	0.56%
Lawn/Garden watering	45.07%	30.42%	14.65%	8.73%	1.13%
Dish washer	18.31%	18.87%	22.54%	28.73%	11.55%
Car/Vehicle washing	59.15%	27.61%	6.20%	6.48%	0.56%
Showering	4.51%	13.24%	30.70%	28.73%	22.82%
Laundry machine	14.93%	21.69%	23.10%	27.32%	12.96%
General cleaning	39.44%	34.93%	17.75%	5.63%	2.25%

12.5 Regression Results

Table 37: Regression Analysis of average of statements of Question 1

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	2.4436	0.1822	13.4094	0.0000	2.0852	2.8021	2.0852	2.8021
Gender	0.0419	0.0938	0.4467	0.6554	-0.1426	0.2264	-0.1426	0.2264
Age	-0.0146	0.0418	-0.3482	0.7279	-0.0968	0.0677	-0.0968	0.0677
Personal annual income	0.0410	0.0281	1.4587	0.1456	-0.0143	0.0962	-0.0143	0.0962
Education level	0.1150	0.0478	2.4068	0.0166	0.0210	0.2090	0.0210	0.2090
Dependent variable: Average of statements of Question 1: Potentials1 Potentials2 Potentials3 Potentials4 Potentials5 Potentials6								
Independent variables: Gender, Age, Income, Education								

Table 38: Regression Analysis of average of statements of Question 2

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	3.5431	0.0999	35.4794	0.0000	3.3467	3.7395	3.3467	3.7395
Gender	-0.0497	0.0514	-0.9669	0.3342	-0.1508	0.0514	-0.1508	0.0514
Age	0.0068	0.0229	0.2988	0.7653	-0.0382	0.0519	-0.0382	0.0519
Personal annual income	-0.0049	0.0154	-0.3197	0.7494	-0.0352	0.0253	-0.0352	0.0253
Education level	0.0759	0.0262	2.8987	0.0040	0.0244	0.1274	0.0244	0.1274
Dependent variable: Average of statements of Question 2: Benefits1 Benefits2 Benefits3 Benefits4 Benefits5 Benefits6 Benefits7 Benefits8								
Independent variables: Gender, Age, Income, Education								

Table 39: Regression Analysis of average of statements of Question 3

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	4.0769	0.1132	36.0038	0.0000	3.8542	4.2996	3.8542	4.2996
Gender	-0.2077	0.0583	-3.5634	0.0004	-0.3223	-0.0930	-0.3223	-0.0930
Age	-0.0041	0.0260	-0.1581	0.8745	-0.0552	0.0470	-0.0552	0.0470
Personal annual income	0.0173	0.0175	0.9890	0.3233	-0.0171	0.0516	-0.0171	0.0516
Education level	-0.0134	0.0297	-0.4507	0.6525	-0.0718	0.0450	-0.0718	0.0450
Dependent variable: Average of statements of Question 3: Concerns1 Concerns2 Concerns3 Concerns4 Concerns5 Concerns6 Concerns7								
Independent variables: Gender, Age, Income, Education								

Table 40: Regression Analysis of average of statements of Question 6

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	3.8374	0.0973	39.4209	0.0000	3.6460	4.0289	3.6460	4.0289
Gender	-0.1880	0.0501	-3.7536	0.0002	-0.2866	-0.0895	-0.2866	-0.0895
Age	0.0437	0.0223	1.9564	0.0512	-0.0002	0.0876	-0.0002	0.0876
Personal annual income	0.0148	0.0150	0.9893	0.3232	-0.0147	0.0443	-0.0147	0.0443
Education level	-0.0206	0.0255	-0.8058	0.4209	-0.0708	0.0296	-0.0708	0.0296
Dependent variable: Average of statements of Question 6: Motives1 Motives2 Motives3 Motives4 Motives5 Motives6 Motives7 Motives8								
Independent variables: Gender, Age, Income, Education								

Table 41: Regression Analysis of average of statements of Question 7

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	3.6868	0.1450	25.4344	0.0000	3.4017	3.9719	3.4017	3.9719
Gender	-0.0235	0.0746	-0.3155	0.7525	-0.1703	0.1232	-0.1703	0.1232
Age	0.0614	0.0333	1.8462	0.0657	-0.0040	0.1268	-0.0040	0.1268
Personal annual income	-0.0041	0.0223	-0.1838	0.8543	-0.0480	0.0398	-0.0480	0.0398
Education level	-0.0492	0.0380	-1.2952	0.1961	-0.1240	0.0255	-0.1240	0.0255
Dependent variable: Average of statements of Question 7: Intention1 Intention2 Intention3 Intention4 Intention5 Intention6 Intention7								
Independent variables: Gender, Age, Income, Education								